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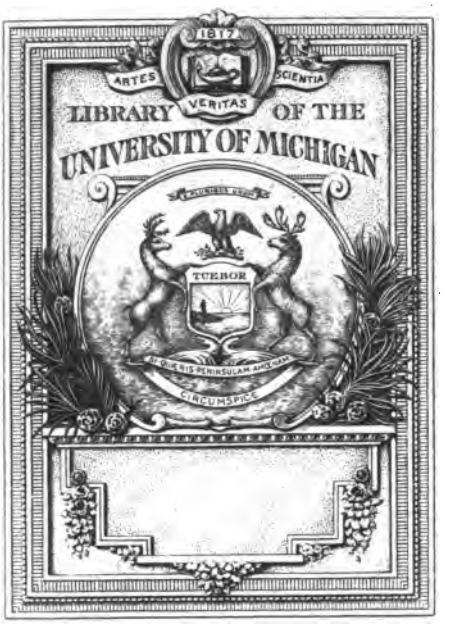
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KANSAS

STATE BOARD OF AGRICULTURE.

WORLD'S FAIR REPORT,

CONTAINING

STATISTICS SHOWING THE GROWTH OF THE STATE AND THE DEVELOPMENT OF HER RESOURCES.

ALSO,

PAPERS SHOWING DIFFERENCE IN CLIMATIC CONDITIONS, CROPS ADAPTED TO DIFFERENT SECTIONS, HORTICULTURE, SCHOOLS, CHURCHES, ETC.

1892: Fifth in corn, fourth in oats, first in wheat, and right in the very heart (center) of our country.

M. MOHLER, SECRETARY.

TOPEKA:
PRESS OF THE HAMILTON PRINTING COMPANY.
EDWIN H. SNOW, State Printer.
1893.

KANSAS STATE BOARD OF AGRICULTURE.

1893.

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INTRODUCTORY.

THIS report was prepared and published by the State Board of Agriculture, on authority of the Kansas board of World's Fair commissioners, and is designed to show the agricultural and other resources of Kansas and the progress made in their development; also to place before the public, in a general way, the advantages the state has to offer to those in the East and in foreign countries who are looking to the West for new homes and profitable investments. In addition, to give also much needed information concerning the soil and climate of Kansas in different sections of the state.

All who are interested are referred to the article by Mr. H. R. Hilton, in this pamphlet, on the "Three Belts of Kansas;" also to reports made by farmers on large wheat yields, on alfalfa, sorghum as a forage crop, and broom-corn growing in western Kansas.

Horticulture is presented by G. C. Brackett, secretary of the State Horticultural Society.

Also, a brief report is made of the manufactures, schools and churches of Kansas, and besides such other information is given as those contemplating new homes in the West need to have.

Those who are interested in the mineral resources of Kansas are referred to the pamphlet published, and to be had on application to the KANSAS WORLD'S FAIR BOARD, Kansas building, Jackson Park, Ill.

Very respectfully, M. MOHLER, *Secretary.*

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KANSAS.

KANSAS is located in the geographical center of the United States, being equally distant from the Atlantic ocean on the east and the Pacific on the west, the gulf of Mexico on the south and British America on the north.

The state has an area of 82,144 square miles, or 52,572,160 acres; and in form is a parallelogram, with a small portion in the northeast corner cut off by the Missouri river, which has a course east of south. The state is 400 miles long and 200 miles wide, and is bounded by states and territories as follows: Missouri on the east, Indian Territory on the south, Colorado on the west, and Nebraska on the north. The state lies within the meridians 94 degrees, 37 minutes, and 102 degrees, west longitude, and the parallels 37 degrees and 40 degrees, north latitude.

The area is equal in extent to the combined area of England and Ireland, or England and Scotland, and exceeds that of Denmark, Saxony, Bavaria, Baden, Hanover and Wurtemburg combined, by 3,000 square miles. It is not as large as either Norway or Sweden, but has more arable acres than both of these countries put together.

At the confluence of the Kansas with the Missouri river, the elevation above sea level is 751 feet, the lowest point in the state. To the westward there is a gradual and regularly-steepening ascent in the surface, the highest elevation attained being 4,000 feet above the sea. Notwithstanding this rapid ascent, there are no mountains or hills within the state exceeding an elevation of 500 feet.

Although there is an absence of mountainous elevations, the surface features present great variety, not lacking ruggedness along the larger valleys, where the rock bluffs are precipitous and rent by numerous ravines. The drainage of the uplands is collected by numerous shallow "draws," which effectually drain the surface. The prairies and plains of Kansas are almost entirely free from marshy tracts.

The drainage system of Kansas has a general easterly and southeasterly course, and is about equally divided between the Missouri and Arkansas rivers.

The Kansas river and its tributaries, the Smoky Hill, Republican, Blue, Vermillion, Delaware, and Wakarusa, drain more than one-half of the state. The Smoky Hill has as principal tributaries the Saline and Solomon rivers, and Big and Hackberry creeks.

The Republican has its source in the plains of eastern Colorado, and, after flowing northeast across the extreme northwest corner of the state, flows along the southern portion of Nebraska, and enters Kansas the second time at the northeast corner of Jewell county. It then flows in a direction east of south, and, with the Smoky Hill, forms the Kansas near Junction City, in Geary county.

The Arkansas, having its source among the mountains of Colorado, enters the state on its western boundary, south of the center, and flows in a generally easterly direction through about one-half of the state, when it turns southeast and crosses the southern boundary in Cowley county. It has numerous small tributaries on both its north and south banks.

The Cimarron, with a direction south of east, drains the southwestern corner of the state.

The principal stream in the southeastern portion is the Neosho, flowing east of south. It receives many small tributaries, and leaves the state on its southern border at the southeast corner of Labette county.

The Marais des Cygnes has its source in the east-central portion, and flows a little south of east to a point in Miami county, from whence it is called the Osage. Flowing then more to the south, it crosses the eastern boundary in Linn county.

The northeastern corner is drained by small tributaries of the Missouri and Kansas rivers, the former flowing east and the latter south.

POPULATION, AREA, ETC.

TABLE showing, by counties, the date of organization, area, and population.

COUNTIES.	*Date of organization.*	*Population, 1890.*	AREA, 1892.	
			Square miles.	*Acres.*
Allen	1855	13,505	504	322,560
Anderson	1855	14,121	576	368,640
Atchison	1855	26,702	423	270,720
Barber	1873	7,941	1,134	725,760
Barton	1872	13,104	900	576,000
Bourbon	1855	28,444	637	407,680
Brown	1855	20,302	576	368,640
Butler	1855	23,971	1,428	913,920
Chase	1859	9,155	750	480,000
Chautauqua	1875	12,209	651	416,640
Cherokee	1866	27,604	589	376,960
Cheyenne	1886	4,386	1,020	652,800
Clark	1885	2,342	975	624,000
Clay	1866	16,099	660	422,400
Cloud	1866	19,238	720	460,800
Coffey	1859	15,812	648	414,720
Comanche	1885	2,534	795	508,800
Cowley	1870	34,430	1,112	711,680
Crawford	1867	30,160	592	378,880
Decatur	1880	8,385	900	576,000
Dickinson	1857	22,267	851	544,640
Doniphan	1855	13,512	379	242,560
Douglas	1855	23,457	469	300,160
Edwards	1874	3,599	612	391,680
Elk	1875	12,190	651	416,640
Ellis	1867	7,933	900	576,000
Ellsworth	1867	9,263	720	460,800
Finney	1884	3,346	864	552,960
Ford	1873	5,305	1,080	691,200
Franklin	1857	20,258	576	368,640
Garfield	1887	884	432	276,480
Geary	1855	10,383	407	260,480
Gove	1886	3,089	1,080	691,200
Graham	1880	5,006	900	576,000
Grant	1888	1,307	576	368,640
Gray	1887	2,419	864	552,960
Greeley	1888	1,250	780	499,200
Greenwood	1862	16,300	1,155	739,200
Hamilton	1886	2,009	972	622,080
Harper	1873	13,191	810	518,400
Harvey	1872	17,553	540	345,600
Haskell	1887	1,069	576	368,640
Hodgeman	1879	2,393	864	552,960
Jackson	1857	14,601	658	421,120
Jefferson	1855	16,800	568	363,520
Jewell	1870	19,326	900	576,000
Johnson	1855	17,367	480	307,200
Kearny	1888	1,571	864	552,960
Kingman	1873	11,811	864	552,960
Kiowa	1886	2,862	720	460,800
Labette	1867	27,520	649	415,360
Lane	1886	2,051	720	460,800
Leavenworth	1855	38,503	455	291,200
Lincoln	1870	9,699	720	460,800
Linn	1855	17,132	637	407,680
Logan	1888	3,377	1,080	691,200

TABLE showing, by counties, the date of organization, area, and population—*Concluded.*

COUNTIES.	*Date of organization.*	*Population, 1890.*	AREA, 1892.	
			Square miles.	*Acres.*
Lyon	1858	23,177	858	549,120
Marion	1865	20,517	954	610,560
Marshall	1855	23,872	900	576,000
McPherson	1870	21,587	900	576,000
Meade	1885	2,514	975	624,000
Miami	1855	19,053	588	376,320
Mitchell	1870	15,015	720	460,800
Montgomery	1869	23,000	648	414,720
Morris	1858	11,356	700	448,000
Morton	1886	723	729	466,560
Nemaha	1855	19,211	720	460,800
Neosho	1864	18,539	576	368,640
Ness	1880	4,947	1,080	691,200
Norton	1872	10,524	900	576,000
Osage	1859	24,778	720	460,800
Osborne	1871	12,055	900	576,000
Ottawa	1866	12,509	720	460,800
Pawnee	1872	5,200	756	483,840
Phillips	1872	13,612	900	576,000
Pottawatomie	1856	17,681	848	542,720
Pratt	1879	8,094	720	460,800
Rawlins	1881	6,723	1,080	691,200
Reno	1872	27,059	1,260	806,400
Republic	1868	18,982	720	460,800
Rice	1871	14,417	720	460,800
Riley	1855	13,128	617	394,880
Rooks	1872	8,015	900	576,000
Rush	1874	5,198	720	460,800
Russell	1872	7,337	900	576,000
Saline	1859	17,326	720	460,800
Scott	1886	1,260	720	460,800
Sedgwick	1870	43,499	1,008	645,120
Seward	1886	1,592	648	414,720
Shawnee	1855	49,018	558	357,120
Sheridan	1880	3,726	900	576,000
Sherman	1886	5,220	1,080	691,200
Smith	1872	15,581	900	576,000
Stafford	1879	8,507	792	506,880
Stanton	1887	1,031	672	430,080
Stevens	1886	1,404	729	466,560
Sumner	1871	39,254	1,188	760,320
Thomas	1885	5,532	1,080	691,200
Trego	1879	2,526	900	576,000
Wabaunsee	1859	11,685	804	514,560
Wallace	1888	2,463	900	576,000
Washington	1860	22,840	900	576,000
Wichita	1886	1,805	720	460,800
Wilson	1865	15,258	576	368,640
Woodson	1855	8,961	504	322,560
Wyandotte	1859	54,197	153	97,920
Totals		1,423,485	82,144	52,572,160

POPULATION.

Growth in the population of Kansas since 1860, up to 1890:

1860	107,206	1880	996,096
1870	364,399	1885	1,268,530
1875	528,349	1890	1,423,485

RAILROADS.

Growth in the railroads of Kansas from 1875 to 1890:

In 1875	935 miles.
In 1885	4,750 miles.
In 1890	8,882 miles.

Kansas ranks third in railroads. Illinois and Pennsylvania are the only states in the union which have more miles of railroad than Kansas.

AGRICULTURE.

Kansas was admitted into the union in 1861, just at the time the country was entering upon the great civil war. During the four years succeeding, through which the war was continued, no progress was made in agriculture. The growth therefore of the state in the expansion of agricultural areas and in the accumulation of wealth has been made almost entirely since 1865, or in a period of 27 years.

This progress is without a parallel in history. The heroic struggle through which her people passed in their successful effort to make Kansas a free state attracted the attention of the entire country and the world.

When immigrants came, they found a delightful and invigorating climate and a soil of unsurpassed fertility. Extensive railroad building opened up large areas to settlement, and in other districts millions of acres were subject to entry under the preëmption and homestead laws. Frontier lines were so rapidly extended, that in 1888 every county in the state was organized.

The progress of the state in agriculture can in no way be so well shown as by the publication of tables giving the area devoted to field crops grown in Kansas, the product and value of each, and the aggregate value of all, for a given number of years.

Such tables are published for 1877, 1884, and 1892, showing the progress made in 15 years. By reference to these tables, the growth in agricultural area devoted to crops, and in the aggregate value of all field crops, are shown.

The area in field crops grew from 5,595,299 acres, in 1877, to 13,011,383 acres, in 1884, and to 18,360,240 acres, in 1892.

The aggregate value of all field crops grew from $45,597,040, in 1877, to $104,945,767, in 1884, and to $119,588,101, in 1892. The tables are as follows:

STATE SUMMARY.

TABLE showing acres, product and value of field crops for the year 1877.

1877.	*Acres.*	*Product.*	*Value.*
Winter wheat....bu.	857,125	10,800,295	$9,662,508
Rye....bu.	119,971	2,525,054	806,092
Spring wheat....bu.	206,868	3,516,410	2,577,620
Corn....bu.	2,563,112	103,497,831	20,206,184
Barley....bu.	79,704	1,875,323	582,977
Oats....bu.	310,226	12,768,488	2,050,001
Buckwheat....bu.	4,112	57,974	46,380
Irish potatoes....bu.	45,018	3,119,084	2,056,078
Sweet potatoes....bu.	1,726	201,423	201,928
Sorghum....gals.	20,783	2,390,131	1,195,065
Castor beans....bu.	50,845	578,356	578,356
Cotton....lbs.	597	101,595	10,159
Flax....bu.	27,735	291,309	305,875
Hemp....lbs.	1,801	1,657,564	99,453
Tobacco....lbs.	717	530,839	53,083
Broom corn....lbs.	21,147	16,917,712	634,414
Millet and Hungarian....tons	164,529	427,602	1,765,583
Timothy....tons	25,212	40,318	225,262
Clover....tons	9,796	18,337	107,362
Prairie hay....tons	503,612	741,763	2,432,660
Timothy pasture....	4,202	.....	.....
Clover pasture....	1,445	.....	.....
Blue-grass pasture....	21,299	.....	.....
Prairie pasture, under fence....	553,717	.....	.....
Totals....	5,595,299	.....	$45,597,040

STATE SUMMARY.

TABLE showing acres, product and value of field crops for the years 1884 and 1892.

1884.	Acres.	Product.	Value.
Winter wheat....bu.	2,151,868	46,681,321	$20,031,932
Spring wheat....bu.	85,260	1,369,110	484,628
Rye....bu.	299,604	6,235,575	1,830,053
Corn....bu.	4,545,908	190,870,686	39,512,734
Barley....bu.	20,771	556,226	177,942
Oats....bu.	780,831	20,087,294	5,568,332
Buckwheat....bu.	1,256	12,980	8,437
Irish potatoes....bu.	80,492	7,558,354	3,544,458
Sweet potatoes....bu.	3,245	302,950	242,360
Castor beans....bu.	9,306	89,183	130,444
Flax....bu.	131,513	1,036,415	1,085,571
Rice corn....bu.	10,026	216,861	82,407
Sorghum....gals.	116,511	.....	1,677,341
Cotton....lbs.	508	142,240	11,379
Hemp....lbs.	73	65,700	3,285
Tobacco....lbs.	204	173,400	17,340
Broom corn....lbs.	54,617	31,775,617	946,416
Millet and Hungarian....tons	441,208	1,137,797	5,393,793
Timothy....tons	152,841	313,071	1,923,322
Clover....tons	81,337	184,020	1,052,842
Other grasses....tons	69,433	147,978	764,579
Prairie, under fence....tons	3,974,471	5,322,266	20,456,173
Totals....	13,011,333	.....	$104,945,767

1892.	Acres.	Product.	Value.
Winter wheat....bu.	3,820,013	70,035,980	$38,534,426
Spring wheat....bu.	309,816	4,502,926	2,157,335
Corn....bu.	5,603,588	138,658,621	42,889,849
Oats....bu.	1,559,049	43,722,484	11,140,224
Rye....bu.	239,173	4,042,613	1,697,057
Barley....bu.	138,226	3,842,954	1,407,983
Buckwheat....bu.	4,818	62,808	47,106
Irish potatoes....bu.	80,147	4,257,504	3,438,042
Sweet potatoes....bu.	3,502	300,000	330,000
Castor beans....bu.	11,087	81,987	102,483
Sorghum....	169,405	.....	1,935,341
Cotton....lbs.	666	145,300	10,171
Flax....bu.	171,517	1,245,655	1,058,721
Hemp....lbs.	47	32,900	1,645
Tobacco....lbs.	371	222,600	22,260
Broom corn....lbs.	75,398	34,016,950	1,105,550
Millet and Hungarian....tons	275,929	493,648	1,974,592
Timothy....	576,315		
Clover....	127,994		
Blue grass....	114,027	700,613	3,503,065
Alfalfa....tons	62,583		
Orchard grass....	5,232		
Other tame grasses....	56,440		
Prairie, under fence....tons	4,955,197	2,374,479	8,232,251
Totals....	18,360,240	.....	$119,588,101

STATE SUMMARY—1891.

TABLE showing the total acreage, amount and value of field crops, and the value of the products of live stock.

CROPS.	Acres.	Product.	Value.
Winter wheat....bu.	3,582,006	56,170,694	$40,997,417 02
Spring wheat....bu.	151,904	2,379,959	1,599,842 07
Corn....bu.	5,209,234	139,363,991	48,057,978 93
Oats....bu.	1,298,745	39,904,443	10,594,457 48
Rye....bu.	332,673	5,443,030	3,528,680 29
Barley....bu.	36,484	1,006,280	411,909 72
Buckwheat....bu.	3,405	44,874	40,386 10
Irish potatoes....bu.	69,542	5,483,900	2,689,637 39
Sweet potatoes....bu.	3,939	404,442	343,775 70
Castor beans....bu.	16,428	114,644	143,305 00
Sorghum....	195,848	.....	*2,060,423 00

*Syrup and forage.

STATE SUMMARY—1891—CONCLUDED.

TABLE showing the total acreage, amount and value of field crops, and the value of the products of live stock.

CROPS.	*Acres.*	*Product.*	*Value.*
Cotton.....lbs.	1,782	445,500	$35,640 00
Flax.....bu.	388,184	2,049,055	1,639,244 00
Hemp.....lbs.	247	172,900	8,645 00
Tobacco.....lbs.	366	219,600	21,960 00
Broom corn.....lbs.	58,225	28,261,450	918,497 12
Millet and Hungarian.....tons	308,093	633,405	2,533,620 00
Timothy	498,854		
Clover	158,589		
Blue grass	101,869	401,640	2,008,200 00
Alfalfa.....tons	34,384		
Orchard grass	5,701		
Other tame grasses	63,702		
Prairie, under fence.....tons	4,997,886	1,369,945	4,062,546 50
Totals	17,518,090		$121,695,665 32
Wool clip.....lbs.		1,578,993	$284,218 74
Cheese.....lbs.		613,772	67,474 92
Butter.....lbs.		29,084,837	4,362,725 55
Animals slaughtered or sold for slaughter			37,922,192 00
Milk sold other than that sold for butter and cheese			528,761 00
Poultry and eggs sold			2,559,297 00
Garden products marketed			818,958 00
Horticultural products marketed			1,199,468 00
Wine manufactured.....gals.		170,369	170,369 00
Honey and beeswax produced.....lbs.		365,221	73,044 20
Wood marketed			128,678 00
Total			$48,115,186 41
Grand totals	17,518,090		$169,810,851 73

TABLE showing live stock, as returned by the assessors, and value, for the year 1891.

LIVE STOCK.	*Number.*	*Value.*
Horses	776,533	$54,357,310 00
Mules and asses	77,170	6,173,600 00
Milch cows	690,611	13,812,220 00
Other cattle	1,770,591	30,100,047 00
Sheep	260,658	716,524 00
Swine	2,085,875	12,515,250 00
Total		$117,674,951 00

STATE SUMMARY—1892.

TABLE showing the total acreage, amount and value of field crops, and the value of the products of live stock.

CROPS.	*Acres.*	*Product.*	*Value.*
Winter wheat.....bu.	3,820,013	70,035,980	$38,534,426 92
Spring wheat.....bu.	309,816	4,502,926	2,157,335 11
Corn.....bu.	5,603,588	138,658,621	42,889,849 01
Oats.....bu.	1,559,049	43,722,484	11,140,224 70
Rye.....bu.	239,173	4,042,613	1,697,057 86
Barley.....bu.	138,226	3,842,954	1,407,983 08
Buckwheat.....bu.	4,818	62,808	47,106 00
Irish potatoes.....bu.	80,147	4,257,504	3,438,042 45
Sweet potatoes.....bu.	3,502	300,000	330,000 00
Castor beans.....bu.	11,087	81,987	102,483 75
Sorghum	169,105		*1,935,341 00
Cotton.....lbs.	666	145,300	10,171 00
Flax.....bu.	171,517	1,245,555	1,058,721 75
Hemp.....lbs.	47	32,900	1,645 00

*Syrup and forage.

STATE SUMMARY—1892—CONCLUDED.

TABLE showing the total acreage, amount and value of field crops, and the value of the products of live stock.

CROPS.	*Acres.*	*Product.*	*Value.*
Tobacco.....lbs.	371	222,600	$22,260 00
Broom corn.....lbs.	75,398	34,016,950	1,105,550 87
Millet and Hungarian.....tons	275,929	493,648	1,974,592 00
Timothy	576,315		
Clover	127,994		
Blue grass	114,027	700,613	3,503,065 00
Alfalfa.....tons	62,583		
Orchard grass	5,232		
Other tame grasses	56,440		
Prairie, under fence.....tons	4,955,197	2,374,479	8,232,251 00
Totals	18,360,240		$119,588,106 00
Wool clip.....lbs.		1,345,787	$228,783 79
Cheese.....lbs.		540,609	59,466 99
Butter.....lbs.		27,705,466	4,155,819 90
Animals slaughtered or sold for slaughter			35,280,273 00
Milk sold other than that sold for butter and cheese			450,212 00
Poultry and eggs sold			2,679,280 00
Garden products marketed			672,231 00
Horticultural products marketed			1,084,368 00
Wine manufactured.....gals.		241,283	241,232 00
Honey and beeswax produced.....lbs.		543,862	108,772 40
Wood marketed			100,410 00
Total			$45,060,849 08
Grand totals	18,360,240		$164,648,955 08

TABLE showing live stock, as returned by the assessors, and value, for the year 1892.

LIVE STOCK.	*Number.*	*Value.*
Horses	804,923	$52,319,995 00
Mules and asses	79,262	5,944,650 00
Milch cows	631,386	11,364,948 00
Other cattle	1,708,368	29,042,256 00
Sheep	240,568	721,704 00
Swine	1,605,098	9,630,588 00
Total		$109,024,141 00

DIAGRAM showing the relative product of wheat (winter and spring), by five-year periods.

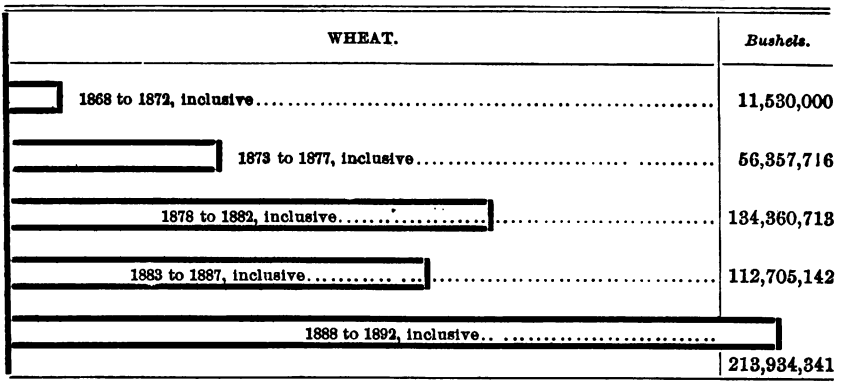


DIAGRAM showing the relative product of corn, by five-year periods.

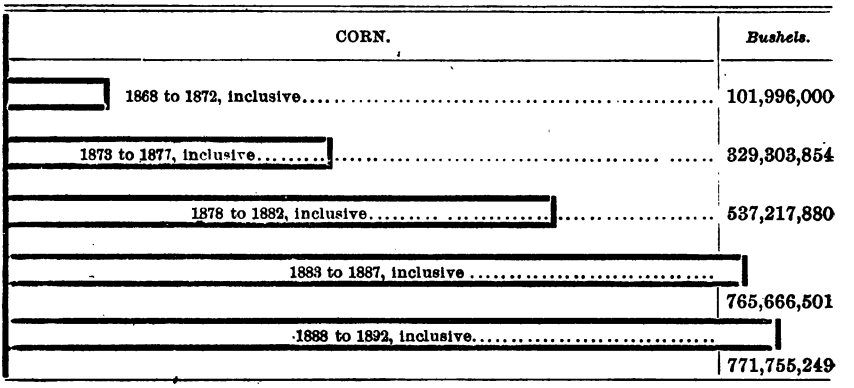
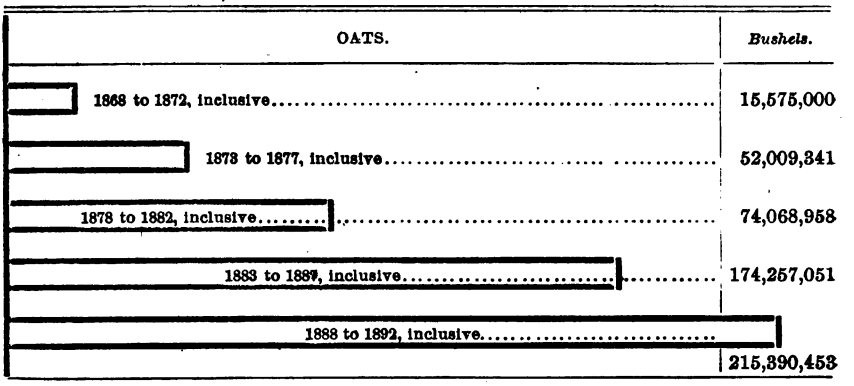


DIAGRAM showing the relative product of oats, by five-year periods.



LIVE STOCK.

TABLE showing the number of the various kinds of live stock, and their aggregate value, in the state, for the years given.

YEARS.	*Horses.*	*Mules and asses.*	*Milch cows.*	*Other cattle.*	*Sheep.*	*Swine.*	*Value.*
1860	20,344	1,496	28,550	61,133	17,569	138,224	$3,332,450
1870	117,786	11,786	123,440	250,527	109,088	206,587	23,173,185
1875	207,376	24,964	225,028	478,295	106,224	292,858	28,610,267
1880	367,589	58,303	366,640	748,672	426,492	1,281,630	61,563,956
1881	383,805	58,780	406,706	839,751	806,323	1,173,199	69,814,340
1882	398,678	56,654	433,381	971,116	978,077	1,228,683	83,866,199
1883	423,426	59,262	471,548	1,133,154	1,154,196	1,393,968	104,539,888
1884	461,136	64,889	530,904	1,328,021	1,206,297	1,953,144	115,645,060
1885	513,830	75,177	575,928	1,402,920	875,193	2,461,522	118,071,808
1886	572,059	83,642	627,481	1,462,736	652,144	1,966,149	129,559,527
1887	648,037	89,957	692,858	1,568,628	538,767	1,847,394	126,558,042
1888	700,723	92,445	742,639	1,619,849	402,744	1,433,245	131,830,778
1889	719,394	90,357	723,552	1,788,436	293,853	1,641,955	116,191,465
1890	716,459	78,346	674,705	1,696,081	281,654	2,192,231	113,533,342
1891	776,533	77,170	696,611	1,770,591	260,658	2,085,875	117,674,951
1892	804,923	79,262	631,386	1,708,368	240,568	1,605,098	109,024,141

PRODUCTS OF LIVE STOCK.

TABLE showing the total value of the products of live stock, to wit: Animals slaughtered and sold for slaughter, wool clip, butter and cheese manufactured, and poultry, eggs and milk sold, for the years given.

YEARS.	*Value.*	YEARS.	*Value.*
1880	$16,933,255 00	1887	$37,545,263 74
1881	21,682,888 25	1888	37,284,447 67
1882	27,559,933 70	1889	40,762,488 62
1883	32,545,737 00	1890	39,998,285 04
1884	40,143,992 00	1891	45,724,709 21
1885	37,130,647 06	1892	42,853,835 68
1886	35,350,525 62		

VALUE OF FARM PRODUCTS.

TABLE showing value of all farm products, consisting of field crops, wool, cheese, butter, animals slaughtered or sold for slaughter, milk sold, poultry and eggs sold, garden products and horticultural products marketed, wine, honey and wax produced, and wood marketed, for the years given.

YEARS.	*Value.*	YEARS.	*Value.*
1877	$66,386,548	1885	$135,381,286
1878	71,829,966	1886	132,895,283
1879	78,340,371	1887	126,542,443
1880	83,311,487	1888	149,698,821
1881	122,946,489	1889	154,619,142
1882	151,817,541	1890	129,119,828
1883	162,883,767	1891	169,811,372
1884	158,479,785	1892	164,648,955

COMPARATIVE STATISTICS.

The statistics given in the table below are taken from the reports of the department of agriculture, Washington, D. C., and represent the comparative rank of the states given in the three great agricultural staples, wheat, corn, and oats, and indicate that Kansas, notwithstanding the trying ordeal through which she has passed in overcoming adverse climatic conditions, makes a creditable showing when compared with two of the best agricultural states in the union, Illinois and Indiana.

TABLE showing average bushels per acre.

YEAR.	KANSAS.			ILLINOIS.			INDIANA.		
	Wheat.	*Corn.*	*Oats.*	*Wheat.*	*Corn.*	*Oats.*	*Wheat.*	*Corn.*	*Oats.*
1882	19.9	33.7	27.0	17.7	23.0	40.7	16.5	31.3	26.8
1883	17.5	36.7	39.4	10.0	25.0	36.1	10.4	27.0	29.7
1884	16.5	36.9	35.0	11.6	30.0	32.8	12.5	29.0	30.0
1885	10.6	32.4	31.8	8.5	31.4	32.8	10.6	35.5	26.8
1886	11.4	21.8	26.4	13.7	24.5	31.8	14.8	31.9	30.7
1887	9.6	14.6	26.6	15.3	19.2	29.5	13.5	20.1	27.0
1888	14.6	27.0	24.0	13.0	36.2	36.5	11.3	35.0	27.0
1889	18.4	35.3	26.5	16.0	32.3	40.0	14.7	29.0	28.2
1890	13.7	15.6	24.0	9.8	26.2	21.0	11.2	24.7	17.5
1891	15.5	26.7	30.0	18.0	33.5	36.2	18.1	33.5	23.5
1892	17.4	24.5	28.5	16.2	26.2	26.3	14.7	29.3	26.5
Averages	15.0	27.7	29.0	13.6	27.9	33.0	13.5	29.7	26.7

By the above statistics it is shown: (1) That Kansas leads Illinois and Indiana in wheat $1\frac{4}{10}$ and $1\frac{1}{2}$ bushels respectively for a period of 11 years. (2) That Kansas falls below Illinois in corn for the same time only two-tenths of a bushel per acre and below Indiana two bushels per acre. (3) That Kansas leads Indiana in oats per acre $2\frac{3}{10}$ bushels, and falls below Illinois four bushels per acre. These statistics make a very satisfactory showing for the young and growing state of Kansas.

MANUFACTURING INDUSTRIES.

An attempt was made to secure complete returns from the industrial interests of the state by the commissioner of labor in his last (eighth) annual report, but the data received were somewhat incomplete and will only serve as a basis of comparison. We present herewith the reports from the three principal cities of the state—Kansas City, Topeka, and Wichita—as prepared under the direction of Mr. Frank R. Williams, special agent of the United States census bureau.

In 1880, the data relating to manufactures in these cities were included in the totals published for the counties; therefore a comparative statement indicating the growth of the manufacturing industries in the several cities during the decade cannot be given.

Only such important or characteristic industries as have three or more establishments engaged therein are included. In Kansas City, among other important industries, in which less than three establishments are reported, may be mentioned men's clothing, wholesale, two establishments; flouring- and grist-mill products, one establishment; mineral and soda waters, two establishments. The five establishments referred to report invested capital, $60,000; hands employed, 119; value of product, $135,240. In Wichita there were seven industries of this character—one car factory, two factories for the manufacture of clothing, two foundry and machine shops, one establishment manufacturing paving and paving material, and two packing houses. These industries report invested capital, $1,864,751; hands employed, 708; value of product, $3,072,474. Against the heading "Material used," is presented the reported cost at the place of consumption of all material used, and against "Value of product" is the reported market value, at the factory, of the total product, not including any allowance for commissions or expense of selling.

In this connection, it must be considered that the difference between apparent cost and value of manufactured product as presented cannot be taken as a correct indication of the manufacturers' net profits, because many other items of expense enter into the mercantile portion of the business, not within the scope of this investigation. It must be borne in mind that the statements presented include establishments which reported a product of $500 or more of value during the year, and, so far as practicable, only those establishments operating works located within the corporate limits of the city.

The following summary table gives a statement of totals under the general heads of inquiry. From it we note that, in the aggregate, 672 establishments report, having an average capital of $24,740.54; employing an average of nearly 17 hands, who each receive an average of $554.20 per annum; the average value of the product being $80,416.69.

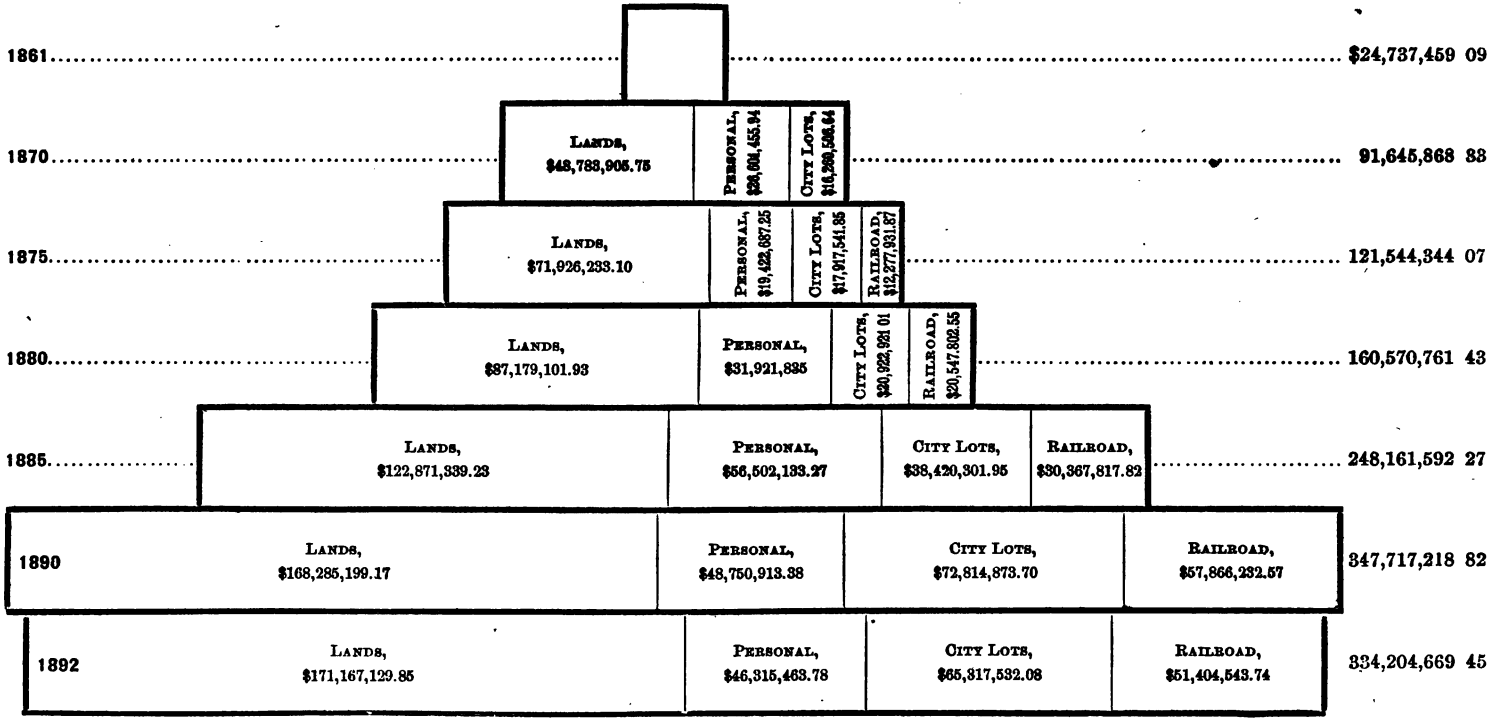
TABLE showing number of industries and number of establishments reporting, amount of capital invested, hands employed, wages paid, cost of material, miscellaneous expenses, and value of product.

LOCATION.	*Number industries reported.*	*Number establishments reporting.*	*Capital.*	*Hands employed.*	*Wages paid.*	*Cost of material used.*	*Miscellaneous expenses.*	*Value of product.*
Kansas City	39	232	$11,404,066	7,300	$4,081,685	$34,225,415	$3,606,641	$44,022,939
Topeka	63	333	2,391,546	2,439	1,320,829	2,930,594	268,522	5,297,752
Wichita	42	107	2,830,029	1,388	764,034	3,260,456	271,021	4,719,336
Totals	144	672	$16,625,641	11,127	$6,166,548	$40,416,465	$4,146,184	$54,040,027

No complete official data are at hand regarding the general industrial interests of the state, outside of these three cities, but it is safe to assume, from what has been obtained the past year, that the figures presented represent about 33⅓ per cent. of the whole, as regards number of establishments reporting, and about 60 per cent. of the capital, hands employed, and value of product. This would make a total of 2,688 establishments throughout the state, with $27,709,401.66 capital, employing 18,545 hands, and producing material valued at $90,066,711.66—not a bad showing for a state that is classed as distinctively agricultural, and whose manufacturing industries are considered as of minor importance in comparison.

ASSESSED VALUATION.

DIAGRAM showing the assessed valuation of the different classes of property for the years given, as per abstracts of county clerks.



HOW WE GET OUR FARM STATISTICS.

BY THE SECRETARY.

THE growing interest in farm statistics, and the higher appreciation of their value, has caused much inquiry as to the best method of collecting them. Applications from as many as 10 states, ranging from West Virginia in the east to North Dakota in the west, have been made in the last three years to the Kansas Board of Agriculture for the plan adopted in *our* state for performing this work. As a matter of general information, both to our own people and those outside, it is well, I think, to give somewhat in detail the Kansas plan for securing farm statistics, and if anyone has improvements to suggest, it will be entirely in order to state them.

We have an agency, created by law, for taking an annual census of crop areas of all kinds, of live stock and products of live stock, of horticultural and garden products marketed, and all things else which are produced on the farm; also, whatever in addition the State board of Agriculture shall require in the instructions given. This agency is the township assessor. The law providing for taking this census, as given in chapter 67 of the Laws of 1875, is as follows:

SECTION 1—Provides that the assessors shall receive a sum not exceeding $3 per day for their services in the discharge of their duties, and shall be paid by the board of county commissioners.

SEC. 2—Provides that assessors shall collect statistical information within their respective townships relating to agriculture, horticulture, manufactures, etc., in the manner provided for in this act, and specified in the instructions which shall be given by the State Board of Agriculture.

SEC. 5—Provides that each assessor shall perform the services required of him by a personal visit to each dwelling house and to each family in his township or city, and shall also visit personally the farms, mills, shops, mines, and other places respecting which information is required, and shall ascertain by inquiries made of some member of each family, if any can be found capable of giving such information, but if not, the agent of such family, and if the agent cannot be found, or should any such person refuse to give the information desired, *then he shall obtain the information from the most reliable source.*

SEC. 6. The State Board of Agriculture is hereby required to carry into effect the provisions of this act relating to the census and industrial statistics, and to provide blanks and distribute the same to the county clerks, who shall deliver them to the assessors, so that the enumeration may commence on the first day of March, and be taken with reference to that day in each and every county, and to prepare and distribute at the same time printed instructions defining and explaining the duties of the assessor in collecting the statistics required by this act. When the returns of said statistics are made, said State Board of Agriculture shall cause the same to be classified and arranged in the best and most convenient manner for use, and publish the same as part of the annual transactions of the State Board of Agriculture, and lay the same before the legislature at the next session thereof.

SEC. 8. The services herein required to be performed by the several assessors in the state, shall be performed at the same time that he performs his services under the general assessment laws of the state, and in connection therewith, and shall not be allowed for such services separately, but for the time employed in taking the census herein provided for, taking general assessment as for one and the same service.

SEC. 9. Any assessor who shall willfully neglect or refuse, in whole or in part, to perform the duties required in this act, shall be guilty of a misdemeanor, and, upon conviction thereof, shall be fined in a sum not less than $20 nor more than $100.

Section 1 of chapter 137, Session Laws of 1873, provides that township and city assessors "shall collect such other statistics, not therein mentioned, as may be required by the State Board of Agriculture," and return the same through the county clerks.

Section 82, Laws of 1873, provides that "the county clerk of each county shall furnish the assessors of his county such blanks as may be necessary for taking the aforesaid statements, which said blanks shall be furnished by the State Board of Agriculture to the county clerks; and the county clerk shall, within 30 days after the aforesaid statements are returned to him, make out and forward a tabular statement thereof, by townships, to the State Board of Agriculture." The assessors' returns, as provided by law, are made to the county clerk, and the county clerk makes an abstract of them and forwards the abstract to the office of the State Board of Agriculture.

Besides this agency created by law for gathering agricultural statistics, the Board of Agriculture has another agency, of its own creation, whose province is to furnish crop conditions, yields, values, and such other information as the Secretary of the Board may think of interest to the public. This agency is a corps of about 600 correspondents. The best men that can be had for the purpose are selected, averaging about six to each county. These six men are located in different sections of the same county; each is expected to keep posted, and report crop conditions, yields, etc., for the entire county at such times as the Secretary of the State Board of Agriculture may desire the information, blanks having been furnished for the purpose.

These public services are rendered without compensation, except that, as a slight recompense, all the publications of the Board are sent to them. Quite a number of our correspondents have served in that capacity for 10 years, or more, and have become experts; all are men who keep eyes and ears open when away from home, and are public spirited enough to make a note of things as they go along and report the results of their observations when called upon by the Board of Agriculture. With such a corps of correspondents, distributed by counties throughout the state, a very near approach to accuracy, with respect to true conditions, yield, etc., of crops, is likely to be reached. The average yield per acre of all cereals is ascertained from the actual yields as reported by thrashers.

THE SORGHUM SUGAR INDUSTRY OF KANSAS.

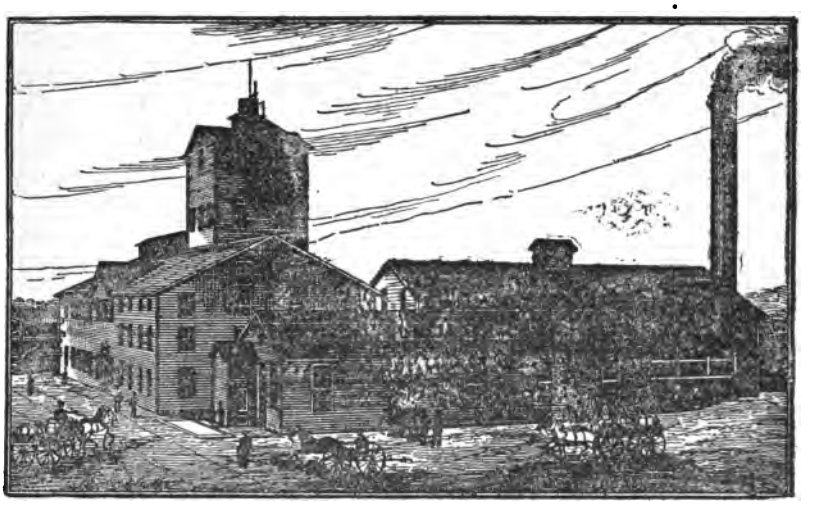
BY GEO. F. KELLOGG, STATE SUGAR INSPECTOR.

ONLY two sugar factories have been operated in the state the past year: The Medicine Lodge Sugar Company Limited and the Parkinson Sugar Company.

Sugar Manufactured.—The amount of sugar manufactured during the year is as follows:

Medicine Lodge Sugar Company Limited	486,400 pounds.
Parkinson Sugar Company	480,900 "
Medicine Lodge Sugar Works and Refining Company	30,800 "
Total	998,100 pounds.

The above does not include the second sugars at Fort Scott and only a small amount of the seconds at Medicine Lodge. When these are inspected, it will add about 100,000 pounds to the season's crop.



SUGAR WORKS AT MEDICINE LODGE.

Medicine Lodge Factory.—Early in May the Medicine Lodge Sugar Works and Refining Company sold their factory and all of their interests in the sugar business to the Medicine Lodge Sugar Company Limited. The new company began at once putting the factory in a thoroughly proper condition for handling a large crop of cane, expending in new machinery and repairs about $18,000; the larger part of this sum being for a new double-effect evaporator, which considerably increased the evaporating capacity of the works. Preparations were made, and the factory was ready to begin operating by the 1st of August, but owing to the unfavorable season

for growing the crop of cane, manufacturing was not begun until about the 12th of September, and continued at intervals until the latter part of October. The cane ripened so slowly, and the drouth had cut down the yield to such an extent, that farmers could not deliver a sufficient quantity to keep the works supplied more than half of the time.

The company met with another serious hindrance, caused by delayed shipments of fuel. They were fully supplied at the beginning of the season, and had standing orders placed with two different mines sufficient to run them through the season, but for reasons beyond their control, and for which they were not responsible, the coal was delivered only at intervals, and in insufficient quantities to run the works continually when they had cane. This caused such delay that several times when their racks were full of cane they were obliged to shut down the works and wait for coal. In the meantime, the cane on hand at the factory, for which they had paid over $2 a ton, soured, and became totally unfit for manufacturing purposes. A portion of it was sold for fodder, at 75 cents a ton, and the balance thrown away. The company intend building sheds and laying in a large supply of fuel before another manufacturing season opens, and thus avoid the possibility of such a loss and delay again occurring.

The company agreed to furnish a detailed report of their work for the past season, but are unable to do so, for the following reason: The sugar company operate the waterworks for the town during the entire year, and have some other interests there, and in preparing the table of expenses it was found impossible to separate the accounts so as to make an accurate report on the sugar business. The director informed me, however, that he thinks they have made a small profit on the season's work. If they have paid expenses and come out with an even balance sheet at the end of the year, it would perhaps be as much as could be expected, in view of all the difficulties they have had to contend with. They are now making preparations for the coming year, believing that with a good crop of cane the next season's business will be remunerative.

Parkinson Sugar Company.—The Parkinson Sugar Company were so well satisfied with the management of their works during the previous season that they continued it the past year. In this locality, many of the conditions were present to prevent the securing of a good crop of cane that existed further west. As usual with this company, they began the manufacturing season by making several car loads of syrup, and did not begin boiling for sugar until about the middle of September.

Realizing the importance of improving the quality of the cane, the superintendent procured a supply of pedigree seed from the government station, at Sterling, and gave more attention than formerly to a thorough cultivation of the crop. They also purchased their cane, for the first time, by the polariscope test. The adoption of these methods resulted in a largely increased yield of sugar for the manufacturer, and a much higher price for cane to the farmer. By these methods, the company have at last produced a crop of cane far superior in quality to any heretofore raised for them, and are encouraged to believe that continued effort in this direction will soon produce as rich cane in this locality as is now grown elsewhere.

The superintendent has submitted the following report:

OFFICE OF THE PARKINSON SUGAR COMPANY,
FORT SCOTT, KAS., January 2, 1893.

To Hon. Geo. F. Kellogg, State Sugar Inspector:

DEAR SIR—In compliance with your request of recent date, we herewith hand you a full report of the work at this factory for the year 1892.

Value of plant..... $75,000 00

Number acres cane delivered at factory (estimated)	900
Number of tons of cane worked for syrup	562
Number of tons of cane worked for sugar	4,276
Total number of tons of cane worked	4,838
Total number of pounds of sugar manufactured	480,900
Total number gallons molasses	56,200
Total number gallons syrup	13,000
Number of pounds of sugar per ton of field cane	112½
Number of gallons of molasses per ton of field cane	13
Number of gallons of syrup per ton of field cane	23
Total number of employés	60
Amount paid per ton for cane (average)	$2 11
Amount expended for new machinery and repairs	2,175 00
Total amount paid for labor to January 1, 1893	5,531 46
Total amount paid for cane	10,222 96
Total amount paid for fuel to January 1, 1893	984 00
Total amount paid for taxes	356 79
Total amount paid for insurance	600 00
Total amount paid for incidentals to January 1, 1893	1,275 30
Total amount paid for salaries and office expenses	1,876 00
Total cost of product	$23,021 51
Value of product, 480,900 pounds sugar, at 2⅝ cents per pound	$11,421 37
13,900 gallons syrup, at 23 cents per gallon	2,990 00
56,200 gallons molasses, at 5½ cents per gallon	3,091 00
State bounty, at ¾ cent per pound	3,606 75
Government bounty, at 2 cents per pound	9,618 00
Total value of product	$30,727 12
Less cost of production	23,021 51
Profit	$7,705 61

It had been our intention to secure a crop of about 10,000 tons. Accordingly, contracts were made with the farmers for 1,350 acres of cane—the largest acreage ever contracted by this company. This, with a fair season, would have produced all the cane the factory could have worked. Owing to the late spring, the farmers were unable to plant all the land contracted. The cane planted late was seriously injured by drouth, and, a portion of it failing to make a good stand, the ground was planted to other crops. We estimated that about 900 acres of cane were delivered at the factory.

For the first time since this factory has been built, it was found impossible to have the cane delivered fast enough to keep the factory in continuous operation. This is due to the fact that the tonnage was less than at any time during the past five years, also to the fact that the factory was in thorough order, and capable of working up to its full capacity every day.

We commenced cutting cane August 25, and finished October 26. Time between date of commencing and date of closing, 61 days. Actual time in operation, 44 days. The expense of operating the plant intermittently, as we were compelled to, was proportionately greater than it would have been had we been able to run continuously.

The light crop was in a measure compensated for by the improvement in its sugar content. This is the first year which has shown a perceptible improvement in its quality. That portion of the crop planted with seed grown at Sterling, by the United States department of agriculture, gave the best results. Some fields of cane contained an average of 13 per cent. to 15 per cent. sucrose in the juice, and numerous single analyses have shown upwards of 20 per cent. sucrose in the juice. These analyses are not as high as some obtained in other parts of the state, where this subject has received more attention than here. With proper cultivation and further improvement, there seems to be no reason why entire crops of cane should not be grown with a sugar content approaching these figures. It is evident to us that the work of improvement has only begun.

Our output was this year 22,700 pounds more sugar than ever before. This increased product was obtained from 1,306 tons less cane than last year. In 1890, our yield of sugar was 47 pounds per ton of cane. In 1891, it was 82 pounds per ton of cane. In 1892, we secured 112½ pounds per ton of cane. These figures are for first sugar, based upon the weight of the cane as grown in the field with seed heads removed. We have not attempted the manufacture of second sugars.

We attribute the increased yield of 1891 over 1890 wholly to more economical methods of manufacture, and the increase in this year's yield over last mainly to the improved quality of the cane.

Yours truly, W. C. PARKINSON, *Superintendent.*

IMPROVEMENT OF SORGHUM CANE AND OF CANE MANUFACTURE.

BY A. A. DENTON, STERLING, KANSAS.

THE settlement of Kansas began in 1854, and since that time sorghum has been grown continuously in the state. It is a native of dry countries, and has proved to be suited to the West, being planted more in the drier portions of the state. It is hardy, and is better suited to the slight cultivation which is usual in new countries than sugar beets or sugar cane, both of which require much greater care and labor in cultivation. It is planted for forage, for syrup making, and for sugar manufacture; and the small patches planted in 1860 have increased to 324,000 acres planted in 1889.

There are few plants in general cultivation which show capacity for so much rapid and permanent improvement; for nearly all field plants have already been improved in centuries of cultivation, while sorghum, until it came to this country, had been grown by peoples who had no agriculture worthy of the name, who used the seeds as grain and chewed the sweet canes, and had no idea of syrup or of sugar manufacture.

The methods of improving plants and of developing superior varieties are now well understood; they have been perfected by long experience, and it is only necessary to use the methods which have been successful with other plants to make as great improvement in the sorghum plant.

The extension of commerce and the increase of travel make it easier now than ever to obtain new and superior varieties of any plant from distant countries. A superior variety of any useful plant can now scarcely escape notice in any country, and is quickly brought to the notice of all who are interested in its cultivation.

It is generally supposed that a great length of time is required for the improvement of a plant, but the discovery of a superior variety often makes very great improvement in a short time; and simply growing pure seed of the superior variety often makes additional improvement. It is only within five years that any persistent effort has been made to improve the sorghum plant, and the work which has been done in that line at the State Experiment Station, at Manhattan, at the government station, at Medicine Lodge, at Calumet plantation, in Louisiana, and at Sterling, shows that sorghum has been improved for sugar manufacture within the past five years, and that it is capable of greater improvement within five years.

In the experimental work which has been done at Sterling, all the varieties of sorghum which could be procured from consuls, from seed dealers, from botanic gardens, from foreign governments, from civilized and uncivilized cane growers, have been planted, in order to select the best varieties.

In addition to this selection of varieties, the canes of the best varieties have been tested separately, and the seeds of the best have been planted. In any field, it may be observed that some of the plants excel. By planting only the best, the next crop is superior, in some degree, to the preceding crop; and by continuing the selection of seed an improved variety is established. The rule is exactly the same as

in stock breeding, to breed only from the best, and the results are exactly the same.

It is observed that occasional variations occur in plants. The causes are unknown; but are often turned to good account. For instance, at Essex, Eng., growing flower seeds is a business. Among millions of plants of one kind, one is sometimes found which is different from and superior to the rest, and an improved variety is formed by planting the seeds of the accidental variation. In a field of early amber in New York, but one cane ripened before frost, and an earlier variety originated from that cane. In Tennessee, a single cane was found differing from the rest, and a superior variety originated from that accidental variation.

Crossing varieties is also a means of producing superior varieties. As a rule, crossed plants are inferior, but occasionally one is found which is superior to the parent varieties, and, sometimes, superior to any other variety, and a new and superior variety may be produced from it.

By these means, by selection of the best varieties, by selection of seed from the best plants of the best varieties, by selection of superior varieties, and by crossing, more improvement has been made in many of our common fruit, flowering and garden plants, in the past 40 years, than had been made in the preceding 40 centuries. And by these means it is possible to improve the plants grown in field, in garden and in orchard still more.

At Sterling, many hundreds of varieties of sorghum, many of them new to this country, have been tested, but there are still many varieties whose value is not known. Five varieties have been selected. Only fair, not extra, cultivation of these varieties gives 250 pounds of sugar—often more—in one ton of the canes. As good manufacture as is done with sugar beets or sugar canes should get 200 to 225 pounds of sugar from each ton of the canes. At 3 cents a pound, 200 pounds of sugar are worth $6, the product of one ton of cane. With this yield, sorghum sugar could be made profitably, without bounty or tariff, and this yield may soon be had.

It appears to be true that it is possible, in Kansas, to deliver a ton of unmanufactured sugar in the cane at a sugar factory cheaper than it can be done in beets, or in sugar cane cheaper than it can be done in any other country. The difficulty is not in lack of sugar; it is in the clarification—that is, in the removal of impurities from the juice. When this difficulty has been met, the Kansas farmer, with cheap apparatus, can make crude muscovado sugar for home use or for local trade, as is now done where sugar cane is grown. The sorghum-syrup factory can make a syrup which will find ready sale at refineries for sugar extraction, as is done in Louisiana, and the sorghum-sugar factories can get as great yield as is obtained in Louisiana from sugar cane.

It is true that extravagant expectations were had of the sorghum industry, that its difficulties were underrated, that it was believed that any seed and any cultivation would produce true sugar canes, and that untried apparatus, with inexperienced management, would make sugar profitably. But the fact remains that sorghum cane can be easily and abundantly produced in this state, that it can easily contain as much sugar as European sugar beets or Louisiana sugar cane, though costing but half as much as either.

A sugar planter, 10 years ago, in Louisiana, got 97 pounds of sugar from each ton of cane; each year he gained in experience and in yield of sugar, and last year he obtained 216 pounds from each ton of cane, making 2,250 tons of sugar in 1892. It seems not absurd to believe that a similar gain may be made in sorghum manufacture, and that it may be made in a similar painstaking way. It seems not untrue to say that the sorghum industry is now quietly making more progress in a practical working way than ever before.

KANSAS AS A FRUIT-GROWING STATE.

BY G. C. BRACKETT, SECRETARY KANSAS STATE HORTICULTURAL SOCIETY.

THE fruit-growing industry in Kansas is an assured success. There is no portion of the state which is not adapted to the successful culture of some of the classes of fruits, and their commercial value has been fully established in the markets of her sister states, both eastward and westward, in a competition with the product of the oldest and most-favored regions. The rapidity of advancement to a leading position in the industry and to extended areas of orcharding has no precedent in the history of older and noted fruit states, and she now holds the distinction of having the largest apple orchards in the world. Among these are the orchards of Messrs. Wellhouse & Son, near Leavenworth, with branches in Johnson, Miami and Osage counties, covering an area of 1,237 acres; and of this area only 437 acres are of bearing age. The product of this portion is given below.

Year.	*Bushels.*	*Year.*	*Bushels.*
1880	1,594	1887	33,095
1881	3,887	1888	20,054
1882	12,037	1889	11,952
1883	12,388	1890	79,170
1884	11,726	1891	63,170
1885	15,373	Total	299,355
1886	34,909		

This total sold for $140,475.08. The cost of picking and putting upon the market was $52,075.30, leaving a net profit of $88,399.78.

The first orchard planted was near Lawrence, in 1856, and contained 150 apple trees. But the beginning of the present orchards dates with the years of 1873 and 1874, and rapidly increased with the following years, until, at this time, the aggregate of fruit trees under culture runs up into the millions, as the following statistics for 1892 show:

	Bearing.	*Not bearing.*
Apple	6,119,609	5,478,284
Pear	158,472	229,152
Peach	4,715,020	1,255,087
Plum	741,443	400,806
Cherry	1,344,177	562,317
Totals	13,078,721	7,925,646

There is a variableness in the climate and soils of the state. The humidity of the eastern two-thirds, and its loamy soil, fits it for the culture of the apple, pear, plum, and cherry, and all classes of small fruits, and, in the southern third, may be added safely the peach. In the western third, where the climate and soil are more arid, the pear, plum, grape, blackberry and gooseberry generally succeed, and in some favored localities the apple and peach and all classes of small fruits may be added to the list.

The climate is of the most congenial character for the development of a fine wood growth and the maturity of fruits, and especially for the ripening of orchard

products, giving a highly delicate coloring and delicious quality, and a condition of maturity which, under proper handling, fits it for transportation to distant markets safely.

There are some locations specially valuable for special classes, viz.: In the northwest, the plum of the *chicasa* family, and some few of the *domestica*, as the Lombard type, yield specially and remarkably fine products, while in the central southern the grape and pear are very successfuly grown; and especially is the sandy loam skirting the Arkansas river the home of the grape, and evidently the commercial vineyards of the West will, in time, be largely planted in this and similar valleys lying to the west and south.

Hindrances to success are in no respect materially different from those occurring in the states eastward, and which seem to follow the settlement of all of the western states. These are mainly insects injurious to the fruit, and fungi which attack the fruit and plants. But all of these, equally prevalent in most all fruit states, are now being easily brought under control, and are not regarded as very serious matters by the intelligent, energetic and thrifty culturist.

THE PUBLIC SCHOOLS OF KANSAS.

BY GEO. W. WINANS, JUNCTION CITY.

No public institution is more highly valued or more cheerfully supported by the citizens of Kansas than are the public schools of the state. In proof of this statement, one needs but call attention to the fact that, in the biennial period covered by this report, there was expended for the support of the common public schools $8,112,624.68, and that almost $700,000 was paid for buildings, furniture, and sites.

The public-school system of Kansas is the result of an earnest effort to embody in the system the best features of the school systems of the older states. Only one state has a larger permanent school fund. This fund now amounts to $5,979,266.48, and is becoming larger year by year. What it will be eventually cannot be accurately estimated. It is yet to be increased by the amount to be received from all the school land sold—one-eighteenth of all the land in the state—and this has been sold on such conditions as allow of payments extending over a long term of years.

The annual fund consists of the interest on bonds held by the state treasurer and the interest on the price of school lands, and is apportioned among the several counties in the ratio of the school population.

The following table shows the amount distributed in the biennial period covered by this report:

In 1891, 96 cents per capita	$489,229 44
In 1892, $1.05 per capita	521,987 55
Total for the two years	$1,011,216 99

ORGANIZATION.

The schools of Kansas are organized on what is known as the independent-district plan. There are now 9,123 such school districts in the state, or an average of 86 districts for each one of the 106 counties. The number of districts in a county varies from 197 in one county to 22 in another. Each district is free to manage its own affairs, subject to the laws of the state. An annual meeting is held in each district on the last Thursday in July of each year. At these meetings, women have the same right to vote as men.

SUPERVISION.

1. *State Superintendent of Public Instruction.*—The constitution provides for a state superintendent of public instruction, who shall have general supervision of the common-school funds and educational interests of the state.

2. *State Board of Education.*—The state superintendent, along with the president of the State Agricultural College, the president of the State Normal School, the chancellor of the University of Kansas, and three others, appointed by the governor for a term of two years, constitute the State Board of Education.

3. *County Superintendents.*—The state constitution also provides that in each county there shall be elected a county superintendent, whose term of office shall be two years. By law it is made his duty to visit each school in his county at least once in each term of six months; to correct deficiencies in the government, classification, and method of instruction, etc.

4. *City Superintendents.*—In each city of the first class or the second class, a superintendent of the city schools is chosen by the board of education, who holds his office during the pleasure of the board, to have the immediate supervision of the schools and the teachers of the city.

COUNTY NORMAL INSTITUTES.

The county normal-institute law, which went into effect in 1877, requires that an institute of not less than four weeks be held annually in every county in the state in which there is a population of not less than 8,000 inhabitants. To show how generally this law is observed, it is necessary only to say that, in the biennial period just closed, each year an institute was held in every county of the state.

The following general summary of the Kansas normal institutes explains itself:

	1891.	*1892.*
Number of organized counties (entire state)	106	106
Number of institutes of at least four weeks	106	106
Number of institutes enrolling not less than 50 members, and entitled to the state aid of $50	106	105
Number of institutes receiving such aid	106	105
Expenditure for maintaining institutes	$33,549 59	$33,876 71
Expenditure from local funds	28,249 59	28,626 71
Expenditure from state appropriations	5,300 00	5,250 00
Total enrollment in institutes	11,506	11,918
Average enrollment for each county	108.5	112.4

The following table is a summary of receipts and disbursements for the entire state for the year ending June 30, 1892:

Amount received from county treasurers	$3,539,986 11
Amount received from state and county funds	492,133 14
Total amount received for school purposes	5,010,981 97
Amount paid for teachers' wages	3,060,457 45
Amount paid for rent, repairs, etc.	628,826 81
Total amount for school purposes	4,346,767 43

PROGRESS OF THE PUBLIC SCHOOLS.

	1862.	*1872.*	*1882.*	*1892.*
Number of counties reporting	28	60	84	106
Number of organized school districts	534	3,419	6,436	9,123
Number of children of school age	13,976	165,982	357,920	498,801
Number of children enrolled	8,595	106,663	269,978	390,728
Average time of school taught, months	3.2	5.4	5.7	6.3
Number of teachers employed	319	3,795	8,250	11,888
Number of schoolhouses		2,437	5,538	9,088
Amount paid teachers	$14,009 67	$596,611 94	$1,296,255 68	$3,060,457 45
Disbursement of state school fund		217,810 80	271,542 24	521,987 55
Amount raised by direct tax	10,381 81	822,644 94	1,442,038 86	3,539,986 11
Value of school property	10,432 00	2,845,262 00	4,381,749 00	10,703,708 00

STATE INSTITUTIONS OF LEARNING.

1. *The University of Kansas.*—The university has now invested in bonds, held by the state treasurer, a permanent fund of almost $140,000; and the fund is still growing. The university is beautifully located, on Mount Oread, at Lawrence. The buildings are large and commodious, the rooms are well lighted and ventilated, all of them heated by steam, and all supplied with electric lights and water. The most recent addition to the buildings is the Snow hall of natural history—a two-story-and-basement building, 110 feet long and 100 feet wide. The university has been, as is stated by the board of regents, very prosperous during the past two

years. "All branches of the work have been prosecuted skillfully and in perfect harmony with the others." One other item of interest in connection with the university: William B. Spooner, of Boston, who died more than 12 years ago, left by his will the handsome sum of $91,618.03 to Chancellor Snow, his nephew, for the benefit of the Kansas State University. This is thought to be the largest sum ever left by will to any state university.

2. *The State Normal School.*—Kansas has but one State Normal School; and it is attended by students from all portions of the state. Like the university, its growth has been remarkable. Beginning in 1865 with only 18 pupils, it has grown until it now is attended by about 1,400 pupils, representing 90 counties of the state. The normal school is beautifully located at the head of the main street of Emporia, and the ample grounds are nicely laid out, and contain an abundance of ornamental trees and shrubs. The large building is well lighted and heated, and is well adapted to the use for which it was erected by the state. The school has a permanent fund of about $136,000; only $4,000 less than the university fund. The interest on this fund, and regular appropriations by the legislature, constitute its means of support.

3. *The State Agricultural College.*—On July 2, 1862, Congress passed an act granting to each state public lands to the amount of 30,000 acres for each of the senators and representatives in Congress, according to the census of 1860, for the "endowment, support and maintenance of at least one college, where the leading object shall be, without excluding other scientific and classical studies, and including military tactics, to teach such branches of learning as are related to agriculture and the mechanic arts, . . . in order to promote the liberal and practical education of the industrial classes in the several pursuits and professions of life." The fund arising from the sale of the lands thus acquired amounted to $501,426.33, and the interest on this amount forms the main income of the college. The college receives from the United States Government, each year, $15,000 for the maintenance of an experiment station; and in 1890 an act was passed by Congress providing that each state should receive for the benefit of its agricultural colleges $15,000 for the year ending June 30, 1890, the amount to be increased by $1,000 for 10 years, at the expiration of which time the amount will be $25,000 per annum. The college has a permanent fund of considerably more than half a million dollars. The interest on this fund, along with the sums already mentioned, makes an annual income of about $70,000.

Besides these three institutions, the state has an institution for the education of the deaf and dumb, located at Olathe; a school for the education of the blind, at Kansas City (Kas.); a boys' reform school, near Topeka; and an industrial school for girls, at Beloit.

Those who are especially interested in the educational institutions of Kansas are referred to the Columbian History of Education in Kansas, published under the auspices of the Kansas State Historical Society, Topeka, Kas.

CHURCHES.

TABLE showing, by denominations, the number of church organizations, aggregate membership, number of church edifices and value of church property in the state, for the year 1892.

CHURCHES.	*Number of church organizations.*	*Aggregate membership.*	*Number of church edifices.*	*Value of church property.*
Advent Christian	30	990	3	$3,200 00
African Methodist Episcopal	48	4,678	58	153,530 00
Associate Presbyterian	4	160	3	3,300 00
Baptist	558	32,698	263	930,016 00

CHURCHES — CONCLUDED.

TABLE showing, by denominations, the number of church organizations, aggregate membership, number of church edifices and value of church property in the state, for the year 1892.

CHURCHES.	*Number of church organizations.*	*Aggregate membership.*	*Number of church edifices.*	*Value of church property.*
Brethren in Christ	9	583	5	$9,500 00
Christian	352	25,200	196	468,975 00
Christian Reformed	2	109	2	3,000 00
Christian Connection	49	1,676	8	10,950 00
Church of God	26	956	6	7,300 00
Congregational	183	11,945	152	485,975 00
Cumberland Presbyterian	68	2,386	25	55,300 00
Cumberland Presbyterian (colored)	6	190	3	15,000 00
Dunkard (conservative)	62	3,228	34	53,425 00
Dunkard (progressive)	16	507	3	5,400 00
Evangelical Association	87	4,241	48	81,700 00
Episcopal	78	2,903	55	398,581 00
Free Methodist	42	880	14	16,256 00
Friends	70	3,257	56	84,815 00
German Evangelical Synod of North America	28	2,053	19	87,750 00
Hebrew (orthodox)	4	403	1	12,000 00
Hebrew (reformed)	2	83	.....	.....
Independent Church in Christ	16	495	4	4,600 00
Lutheran (English)	193	15,633	139	408,510 00
Lutheran (Danish)	1	120	1	800 00
Lutheran (German)	87	7,501	61	94,400 00
Lutheran (Norwegian)	8	344	4	5,500 00
Lutheran (Swedish)	40	4,954	27	62,500 00
Latter-Day Saints	25	1,072	4	3,300 00
Methodist Episcopal	1,249	83,288	734	1,912,015 00
Methodist Episcopal (South)	83	3,346	40	83,450 00
New Jerusalem (Swedenborgian)	3	62	1	10,000 00
Presbyterian	370	24,050	267	1,078,860 00
Reformed Church	27	1,030	16	52,400 00
Reformed Presbyterian	9	758	7	15,000 00
Roman Catholic	367	67,562	271	625,561 00
Salvation Army	12	307	.....	.....
Seventh-Day Adventist	67	1,990	21	15,950 00
Seventh-Day Baptist	3	229	1	3,500 00
Spiritualist	9	627	.....	.....
Unitarian	4	185	3	21,500 00
United Brethren	155	5,745	47	82,100 00
United Presbyterian	58	3,669	48	127,350 00
Universalist	6	411	6	25,000 00
Wesleyan Methodist	18	464	6	10,150 00
Welch Calvinistic Methodist	5	115	4	3,650 00
Totals	4,539	326,938	2,566	$7,467,069 00

DENOMINATIONAL SCHOOLS.

TABLE showing name, denomination, and location, average attendance, salaries paid, and value of buildings and property.

NAME OF ORGANIZATION.	*Denomination.*	*Location.*	*Average yearly attendance.*	*Average monthly salaries paid teachers.*	*Value of buildings and other school property.*
Baker University	Meth. Episcopal	Baldwin	475	$110 00	$100,000 00
Bethany College	Swedish Luth'n	Lindsborg	393	75 00	140,000 00
Bethany College	Episcopal	Topeka	325	60 00	350,000 00
College of Western Kansas	Presbyterian	Dodge City	40	75 00	50,000 00
Central College	United Brethren	Enterprise	162	65 00	75,000 00
Cooper Memorial College	United Presby'n	Sterling	100	60 00	25,000 00
Dodge School of Theology	Meth. Episcopal	Dodge City	30	.....	.....
Emporia College	Presbyterian	Emporia	82	87 50	100,000 00
Friends' Academy	Friends	Beloit	32	60 00	3,000 00
Friends' Academy	Friends	Leavenworth	95	75 00	5,000 00
Fairmount Institute	Congregational	Wichita	50	60 00	50,000 00
Garfield University	Christian	Wichita	150	100 00	500,000 00
Hesper Academy	Friends	Hesper	40	75 00	5,000 00
Highland University	Presbyterian	Highland Station	128	77 00	62,000 00
Kas. Wesleyan University	Meth. Episcopal	Salina	205	80 00	25,000 00

DENOMINATIONAL SCHOOLS—CONCLUDED.

TABLE showing name, denomination, and location, average attendance, salaries paid, and value of buildings and property.

NAME OF ORGANIZATION.	*Denomination.*	*Location.*	*Average yearly attendance.*	*Average monthly salaries paid teachers.*	*Value of buildings and other school property.*
Lane University	United Brethren.	Lecompton	250	$50 00	$65,000 00
Lewis Academy	Presbyterian	Wichita	215	90 00	65,000 00
McPherson College	Dunkard	McPherson	235	70 00	106,009 00
Midland College	Eng. Lutheran	Atchison	125	100 00	50,000 00
Nazareth Academy	Catholic	Concordia	80	30 00	25,000 00
North Branch Academy	Friends	North Branch	45	50 00	1,500 00
Osage Mission School	Catholic	Osage Mission	105	25 00	.....
Oswego Female College	Presbyterian	Oswego	50	45 00	30,000 00
Ottawa University	Baptist	Ottawa	275	100 00	130,000 00
Parochial schools	Ger. Lutheran	.....	1,761	39 00	16,250 00
Sacred Heart Par. School	Catholic	Salina	110	20 00	10,000 00
Southern Kansas Academy	Congregational	Eureka	75	60 00	13,000 00
Southwest Kansas College	Meth. Episcopal	Winfield	160	100 00	80,000 00
St. Anne's Academy	Catholic	Clyde	50	.....	8,000 00
St. Benedict's College	Catholic	Atchison	150	.....	75,000 00
St. John's School	Episcopal	Salina	58	95 00	65,000 00
St. Mary's College	Catholic	St. Mary's	280	60 00	95,000 00
Stockton Academy	Congregational	Stockton	50	50 00	13,000 00
Washburn College	Congregational	Topeka	300	90 00	466,000 00
Washington Academy	Friends	Washington	125	75 00	20,000 00
Totals			7,391	$69 80	$2,583,759 00

CLIMATE OF KANSAS.

BY PROF. J. T. LOVEWELL, METEOROLOGIST TO STATE BOARD OF AGRICULTURE.

SITUATED between the 37th and 40th parallels, Kansas enjoys a most delightful medium between the rigors of Arctic cold and tropic heat. Its location is equally fortunate in elevation above the sea, as it slopes gradually in the west from an altitude of 2,500 feet to somewhat less than 1,000 feet above sea level in the east. Kansas has no marshes nor arid plains. It is well watered by the Arkansas and Kansas rivers, with their numerous tributaries. It has no mountains, though the surface is pleasantly diversified with low bluffs and the variety of a rolling prairie.

Such must be our judgment from a survey of the map of Kansas. When we come to a personal experience of its climate, we shall find a result which confirms our theories. We are better prepared at this date to declare just what Kansas climate is than at any former period. Our weather statistics have accumulated till we are no longer left to conjecture, nor to the uncertain memories of our oldest settlers, to state our annual rainfall and its distribution, what are the means and extremes of temperature and how they vary in different localities, what are the prevailing winds, what the amount of sunshine, and what storms we may expect. We are able to show the time available for securing crops; also, what provision must be made in providing shelter and food for cattle outside of the grazing season.

From tables published in volume XI of the reports of the State Board of Agriculture, it is found that, in Kansas, rainfall is greatest in the eastern parts, where the annual mean is not far from 34 or 35 inches; in the middle portions it is about 25 inches; while in the extreme west it diminishes to 15 or 20 inches.

In looking at the distribution, we find that May, June, July and August give us about one-half the annual supply, while December, January, February and March give only about one-third as much, or one-sixth the annual rainfall.

This distribution could not be better arranged for our agricultural needs. Moisture is not required in the cold months, when precipitation is least, and the wet season is the time for growing and securing our crop. The time for spring and fall planting is usually a favorable medium between wet and dry weather.

We find by comparing different years that quite a variation in the amount of rainfall is exhibited. We give in the following table some of the more notable of these extremes:

STATIONS.	*1872.*	*1874.*	*1875.*	*1877.*	*1882.*	*1883.*
Fort Leavenworth	44.21	24.21	25.51	44.01	22.07	39.38
Fort Riley	31.55	15.24	13.86	32.68	21.44	22.02
Lawrence	32.63	28.87	28.87	41.09	27.60	40.65
Fort Dodge	.....	.....	10.69	27.89	13.44	28.50
Topeka	.....	.....	.....	.....	24.74	39.93
Independence	.....	26.65	48.32	46.56	34.00	34.27

From these it will be observed, that there is an alternation of wet and dry seasons. Sometimes, as in 1874 and 1875, two dry years occur in succession, and in 1875

we note a local peculiarity in the rainfall of Independence, in the southeastern part of the state, where the precipitation was the largest in 16 years, while in most parts it was a very dry year. A great portion of this difference seems to have been due to a few excessive rains in that place, which amounted to over 10 inches, in the month July. There seems to be a periodicity in the recurrence of wet and dry seasons, but the lengths of the periods and the laws concerning them cannot now be stated with any certainty.

In these conditions it is not unlikely that Kansas is much like most of the United States, and its inhabitants must be prepared to meet these natural vicissitudes.

The great importance of rainfall has led to much speculation as to question of its permanent increase with settlement, cultivation, and planting of trees. It is a common opinion that there has been a marked increase in the amount of rainfall since Kansas was settled. The most careful study of our records, however, fails to show this conclusively; but when it comes to decide whether settlement has brought a change of climate, we may answer affirmatively, without insisting that the annual rainfall has increased. The breaking up of large areas of prairie soil promotes absorption and retention of moisture, and so utilizes the rains which formerly fell on the buffalo grass and other vegetation which did not allow it to enter the hard, dry turf, but turned it off into the water courses. The moist humus of the fallow soil now retains this rain, and supplies it as needed to growing crops. It tends also to give a humidity to the air, and may help, in some degree, the formation of local showers.

It is probably due to this, and to the better knowledge of how to adapt crops to our climate, that makes so prevalent the idea that our annual rainfall has increased. Farmers are certainly getting rich now in localities once thought to be a dry desert, only fit for a little precarious grazing. We believe that improvement in this direction will continue till very little of Kansas will be found unsuited to some crop profitable for cultivation.

TABLE showing mean temperatures.

STATIONS AND EXTENT OF RECORD.*	January	February	March	April	May	June	July	August	September	October	November	December	Annual mean
Ft. Leavenw'th, {1836–'88†} {1836–'83}	.91	1.63	1.36	2.63	3.76	5.12	3.90	3.74	3.22	2.18	2.58	1.50	{33.05 / 32.45}
Leav'nw'th Sig. Sta., 1872–'88	1.32	1.48	2.36	3.72	5.21	5.62	4.62	3.80	3.48	3.21	2.36	1.66	38.24
Lawrence, 1858–'88	1.26	1.28	2.29	3.17	4.05	4.94	4.26	3.60	3.60	2.89	1.87	1.61	34.66
Topeka, 1879–'88	1.05	1.36	1.65	2.74	3.74	5.51	3.61	4.01	2.85	3.26	1.97	1.10	32.38
Paola, 1869–'72													35.71
Burlingame, {1858–'60} {1872, '73}													31.98
Neosho Falls, 1859–'61													32.28
Leroy, 1869, '71													40.43
Fort Riley, 1854–'87													24.18
Manhattan, 1858–'87													30.89
Waterville, 1877–'79													37.78
Salina, 1883–'88	.82	.82	.95	3.03	3.33	4.33	4.50	3.63	1.80	2.52	.43	.77	26.93
Fort Hays, 1868–'74													22.77
Independence, 1873–'88	1.52	2.18	2.08	3.68	4.23	5.75	4.08	3.23	3.72	2.98	1.99	2.97	44.25
Wellington, 1879–'88	.71	1.12	1.24	3.28	4.89	4.44	3.99	2.91	3.80	3.28	.99	1.05	32.05
Allison, 1884–'88	1.26	.86	1.31	3.11	3.14	2.93	4.18	2.65	1.76	1.17	.43	.76	24.35
Waterville, 1878–'80													37.78
Dodge City, 1875–'88	.37	.55	.82	1.58	3.89	3.37	3.37	3.14	1.23	1.24	.57	.76	20.91
Fort Wallace, 1870–'74	.09	.20	.07	1.75	2.74	1.03	2.82	1.20	1.23	2.38	.46	.10	13.21
Concordia, 1886–'88	.58	.69	2.05	2.00	4.34	2.92	3.15	3.18	3.01	1.52	.90	.46	25.58
Fort Harker, 1871													22.99
Williamstown, 1871													36.06
Fort Larned, {1861, '62, '64 '65, '67, 1870–'74}													20.70
Holton, 1870, '71, '72, '74													36.31

*Inclusive.
†Including five years from signal service.

Like most dry, interior regions, Kansas has quite a wide range in its extremes of temperature. Dividing the state into three nearly equal portions, by lines running from north to south, and naming them eastern, middle and western divisions, respectively we find the following mean temperatures:

DIVISIONS.	*1888.*	*1889.*	*1890.*	*1891.*	*1892.*
Eastern	53.7°	53.8°	55.80°	53.5°	53.13°
Middle	.....	.....	55.25	52.8	53.62
Western	51.7	.....	54.46	51.5	52.69

These averages are obtained from records of 10 to 20 stations in each division.

As regards extremes of temperatures, we frequently have a few days in winter with a temperature as much as 20 degrees below zero, and in summer it is not rare to have the air get as hot as 100 degrees, especially in the middle and western portions. These extremes occur always when the air is very dry, and they are more easily borne on that account.

WINDS AND STORMS.

Like all countries unsheltered by mountains, Kansas is sometimes swept by high winds. They undoubtedly contribute much to the salubrity of our climate, although it must be admitted when they take the character of a "blizzard," or of the scorching hot wind that comes from the southwest, they are neither pleasant nor profitable. The blizzard is a sudden cold northwest wind that is accompanied by blinding snow, and is by no means peculiar to Kansas. The damage done by it is the injury to stock and men who are caught unprotected and unable to reach shelter. Fortunately it is of short duration. The hot southwest wind, on the other hand, may last for days, and sometimes is of great detriment to the corn crop. The evil effects of both these winds will be greatly mitigated when the surface is broken up by buildings, trees, and shrubbery.

As regards tornadoes, which it has struck the popular taste to speak of as cyclones, Kansas is no more exposed to them than any other portion of our country. The records of the last 12 years show that we have been singularly free from storms of this kind. There is no reason to think they are more frequent now than at any former period, and the popular estimate of danger from them is greatly magnified. When they occur, the best plan is to get out of their way, if possible, and there are certain practical rules, which should be understood by all, for reaching places of security. There is little to confirm the idea that man can ever control these great natural phenomena, either by bombarding the tornado or by compelling the moisture of the air to descend in rain. The experiments thus far made have reached no reasonable degree of success, and we cannot advise investments in real estate because there is a rain-making attachment. We can, however, urge all who desire homes in a fine, invigorating climate, where the soil is rich and inexhaustible, to come to Kansas.

In the above presentation we have sought to give facts as shown by the best evidence, and can only add, "Come and see." The season is long enough, so that in southern Kansas cotton is successfully grown. Peaches do well except for the excessive cold of some of our winters. The crops of wheat and corn are unequaled, and the general healthfulness unsurpassed.

KANSAS BY BELTS.

BY THE SECRETARY.

THE farm statistics and other information given in the preceding pages relate to Kansas as a whole, but because of the marked difference in climatic conditions in western Kansas from those of eastern Kansas, it becomes necessary to an intelligent understanding of agriculture in the different sections to treat of agriculture in Kansas by sections or belts.

For an intelligent and thorough treatment of this subject, the reader is referred to the paper in this report on "The Three Belts of Kansas," prepared by H. R. Hilton, of Topeka, who treats of the difference in climatic conditions as to their effect on agriculture, and of the necessity of adopting an agriculture which is adapted to the character of the climate in which farm operations are sought to be carried on, and also of the stock interests of the state of Kansas, as affected by difference in conditions. The failure on the part of the early settlers of western Kansas in agriculture is to be attributed chiefly to their ignorance of methods of soil treatment, kind of crops to be grown.

We only add that the problem of successful agriculture in western Kansas has been in process of solution for years. Intelligent and public-spirited farmers have been experimenting in that section for a long time, and by so doing they have made some important discoveries. They have discovered, while clover and other tame grasses adapted to a moister climate are not successfully grown, that a substitute of equal or greater value is successfully grown there in alfalfa; and to show how marvelously successful this crop has been in western as well as central Kansas, a number of farmers have been requested to tell briefly in reports given in this pamphlet how they grow alfalfa, the value of the crop, etc. In like manner, those pioneer farmers, who at great cost have performed valuable public service, have discovered that if they cannot grow corn profitably in western Kansas they can grow a substitute in sorghum, Kaffir corn, etc., which enable them to grow stock of all kinds at a less cost than in eastern Kansas, or in any other country eastward. As proof of this, we have asked some 30 farmers, representing different portions of western Kansas, to testify in this report. Read what they say about sorghum as a forage crop, also what Prof. C. C. Georgeson says of its value as a crop.

Again, to show what western along with eastern and central Kansas has done in wheat growing, in three out of four years, farmers in the different sections have been requested to report a few of the large yields of wheat grown in their respective sections. These reports of successful wheat growers, which could be multiplied many times, will be found interesting reading.

And finally, to show that broom-corn growing is profitable in western Kansas, as well as elsewhere, and a crop that never fails, a considerable number of farmers have been asked to give the cost of growing an acre of broom corn, the gross value of the product, and in this way show the net profit per acre. It may be a surprise to many people that broom-corn growing yields a net profit per acre of from $4 to $10, on land which can be bought for $10 or less up to $15 per acre.

THE THREE BELTS OF KANSAS.

BY H. E. HILTON, TOPEKA, KAS.

CLIMATE and products alike make a natural division of Kansas into three parts or belts, from east to west. This division is now recognized by the State Board of Agriculture, and by this division the varied resources of the state are more intelligently presented.

The eastern belt, familiarly known as eastern Kansas, averages 125 miles in width by 200 miles in length, and contains 39 counties, embracing, in round numbers, 16,500,000 acres.

The central belt, familiarly known as central Kansas, averages 140 miles in width by 200 miles in length, and contains 35 counties, embracing 18,500,000 acres.

The western belt, or western Kansas, averages 135 miles in width by 200 miles in length, and contains 32 counties, embracing 17,000,000 acres.

The elevation of eastern Kansas varies from 800 feet, in the southeast, to 1,400 feet at the northwest, in Marshall county. In central Kansas, the elevation varies from 1,000 feet in Cowley county, in the southeast, to 2,200 feet in Kiowa, in the west and Phillips in the northwest. The elevation of western Kansas varies from 2,200 to 3,800 feet.

The average annual rainfall of eastern Kansas is from 35 to 40 inches; of central Kansas, from 25 to 30 inches; of western Kansas, from 16 to 20 inches. As a rule, the eastern edge of each belt exceeds the average, and the western edge is less than the average. In all three belts, the greatest rainfall is in the growing months; the least, in the winter months.

The gradual ascent from the east line of the state to its western limits, and the diminishing rainfall, equaling 10 inches per annum for every 1,000 feet of elevation, give great variety to its vegetation. There are also marked differences in the characteristics and properties of the soils of the different belts, and especially between those of eastern and central Kansas; hence, we find that the crops and systems of cultivation most successful in eastern Kansas may not be adapted to or may need different treatment in central or western Kansas, and *vice versa.*

There are some products common to all three belts; and again, each belt has special resources and advantages peculiar to itself, because of elevation or climate, that can be and are being utilized to profit. Cattle and hogs, Kansas' greatest resource, are common to all belts, but owing to climatic differences the methods of handling—cattle especially—are essentially different in the eastern and western belts.

Kansas, in common with all cis-Missouri agricultural states, is on the border land of the great plains; hence there is a greater difference in the climate and rainfall of its different parts than is common to any state east of the Missouri river. It is this marked contrast between elevation, climate, rainfall and flora of the eastern and western limits of the state that has made its division into three parts so necessary to an intelligent comprehension of its varied resources.

If the reader will keep these different characteristics of the three belts in view, the description of each belt which follows will be more intelligible.

EASTERN BELT.

Eastern Kansas is more varied in its topography and the quality of its soil than either of the other belts. Its numerous valleys, many of them one or more miles in width, are rich in fertile soil. Timber fringes all the streams that wind their tortuous way along and down these valleys, and furnishes excellent shelter and winter feed lots for cattle and hogs, as well as fuel. These valleys produce successfully all the products of a temperate zone, but corn is the principal crop and beef and pork the great products. The appearance of the farms and farm houses along these valleys evidence their fertility.

The uplands of this eastern belt are generally broken, near the confines of the valleys, receding into gently or high rolling table lands. These uplands are generally fertile, and in many places equal the valley land. Corn predominates on the upland farms, also, but the list of crops is more varied, and fruit has more attention than on the valley farms.

On the western side of this eastern belt, where the limestone predominates, the upland soil is rich, but generally is better adapted for grazing than farming.

Limestone is the prevailing rock formation of eastern Kansas. Sandstone is prominent in several southern counties.

Eastern Kansas has long since passed its pioneer stage. Much of its land has been cultivated 30 or more years. There are evidences of prosperity and prosperous farmers in every one of its counties, and in more than half of the number there are undoubtedly more independent farmers and comfortable farm homes, considering the time and initial capital, than can be found in an equal number of counties in any state in the union. Farming is no longer conducted as a matter of necessity, to get a foothold by makeshift methods, but as a matter of business and profit. The best methods are brought into use, because farmers are now financially able to adopt them. Mixed farming, rotation of crops, application of manure and seeding down to clover, have generally taken the place of one crop, year after year. Corn, beef and pork lead as products; but products of the dairy, poultry yard and orchard are being rapidly increased.

The dairy is receiving marked attention from the progressive farmers of eastern Kansas, and is at this time a growing industry, and promises at an early date to be a very important one.

Winter apples are now an important product of eastern Kansas, where are found some of the largest orchards of the world. Several orchardists ship their apples direct to foreign ports, giving Kansas apples a name and a market quotation in foreign marts. In the southern counties of this belt peaches are successfully grown. Small fruits find in all parts of eastern Kansas a congenial clime.

Clover is now a product of eastern Kansas, and its acreage is rapidly increasing from year to year, both for hay and hog pasture. Timothy is also successfully grown on most of its soils, and Kentucky blue grass finds a congenial element in the lime which is a constituent of eastern Kansas soils. It is naturally and gradually spreading southwestward from the Missouri river, and taking the place of the wild varieties of grasses on all uncultivated spots in the fence corners and on the roadsides.

The bottom lands of eastern Kansas vary in price from $25 to $60 per acre, according to improvements and locality. The best uplands, from $15 to $50 per acre. Lands suited for grazing only, from $4 to $10 per acre. Good unimproved lands can be bought for $12.50 to $20 per acre, capable of being developed into first-class farms, and every county affords opportunities to combine good tillable land and pasturage.

The stock interests of the eastern belt will be treated separately, under the head "Live Stock."

CENTRAL BELT.

Central Kansas presents a uniformly gently-rolling prairie and soil of great fertility and unlimited depth. The small percentage of waste land within its limits is exceptional. Over 90 per cent. can be cultivated, and the acreage under cultivation is much larger than in eastern Kansas. There is no very marked difference between valley and upland soils, and the uplands of the central belt will equal the valleys of the eastern in fertility. The soil of central Kansas is preëminently a wheat soil, although its eastern half, besides leading the state in percentage of area planted in corn, can show also an average yield per acre, year after year, equal to that of any state, as shown by the comparative tables in this pamphlet, prepared by the Secretary. In this belt we find a large acreage of both wheat and corn. Wheat predominates in the western half; corn in the eastern half. Broom corn is a prominent product of central Kansas, and one of the surest crops for all years.

Fruit is also becoming a feature of every farm, and the experience of the pioneer fruit growers is now invaluable to those who follow. Varieties have been tested or developed, adapted to climate and existing conditions, so that none need now make a failure of fruit growing, or waste time in determining what varieties will grow, and what are best suited to his wants.

The grass area of central Kansas, and especially of its eastern counties, is limited, because so much of it is adapted to cultivation, and has been brought under the plow. For this reason, steers are, and will be, purchased from breeders further west, and full-fed on corn. Pork is a prominent product of the central belt; and now that alfalfa clover is being so successfully cultivated, hogs can be cheaply raised and carried through summer on these alfalfa pastures, the corn being used only to fatten them. Alfalfa clover hay is also coming more and more into use, as its value is ascertained, and is a valuable reinforcement to the food products of the central belt. Sorghum and Kaffir corn are excellent fodder crops, grow readily on the highest uplands, and, having great powers of resistance to seasons of limited rainfall, are invaluable as a safeguard against a possible shortage of corn. A new candidate for honors as a forage plant, that grows readily on any soil, in any season, wet or dry, and produces abundantly a nutritious forage, is the "Soy bean," recently introduced through the State Agricultural College.

The rainfall of central Kansas is less than that of eastern Kansas, but the subsoil of central Kansas stores more rainfall and better conserves moisture than do most of the subsoils of the eastern belt. The top soil of the central belt reaches to the bottom of the well, and seems to have a nearly perfect arrangement of the soil particles to secure free circulation of water through the soil. There is just enough sand mixed with the rich loam soil to make it drain readily from the surface and work easily. Cloddy land is almost unknown. Soil plowed deep, or subsoiled, every five years, given thorough surface cultivation before seeding, and in case of corn, during growth, has given best results in the central Kansas soils; and when so treated can produce abundantly on a very limited rainfall, much less than would be possible in the soils of the Mississippi valley east of the great plains.

The pioneer days of central Kansas were full of discouragements. Proximity to the "arid plains" subjected the pioneers to drying winds, which occasionally proved disastrous. These adverse conditions have been gradually modified by the increased acreage under cultivation, the planting of trees, the ranker grasses and vegetation, and the western extension of the agricultural frontier into western Kansas. The gain was not necessarily in increase of rainfall, which is not proven, but in retention and storage of the rain that now falls on plowed soil as compared with that on the prairie sod. In the changed condition of the soil itself, the gain in moisture retained for use is manifold, and, except in exceptionally dry seasons, has proved

sufficient for some of the staple crops in every season, and all of them in many seasons.

The pioneer farmers of central Kansas had no precedents to follow; it was only by experience that they learned to forget many excellent methods of farming in the East and adapt themselves to the conditions of climate and soil as they found them. The knowledge gained—the adjustment to environment—has changed many methods, and, among the more intelligent, reduced failures to a minimum. There are among the farmers of central Kansas those who prosper and those who fail, those who work and those who idle, those who live within their means and those who live beyond them, those who have been unfortunate from preventable causes and those who have suffered loss through no fault of theirs; yet, remembering the limited capital the present farmers brought to their new homes, and even adding to this the amount they still owe on their farms—when we compare these items with the present value of their farms, or compare the present condition of many of these farmers and their farms with the days when they drove their first stake in the prairie homestead, with nothing but grit, a faithful wife, a team of work animals, and a cow—then we see to what a large population central Kansas has furnished valuable farms and beautiful homes. The early privations of these pioneer days have given to the state a sturdy and independent people. They have conquered an adverse climate, and, working through natural laws, have, in a large measure, made it subject unto them. The transformation of central Kansas, from the days of the "Santa Fé trail" to the present time, is one of the marvels of our days, and to none does it seem so marvelous as to those who saw it in the natural state, when man first invaded its territory and dreaded its arid climate as much as its Indians.

Good improved farms vary in price from $20 to $40 per acre, according to location and improvements; good tillable unimproved lands, from $7 to $20 per acre; lands fit only for grazing, for from $1.50 to $7.50 per acre.

WESTERN BELT.

Western Kansas is the western border land of agriculture. What has been said of the soil of central Kansas is true of this belt, except that, having less rain to wash out its nitrates and other elements of fertility, it is even richer in food for plant life. It is an ideal soil so far as texture and fertility are concerned. There are stretches of sand hills of varying width south of the Arkansas river and in most of the southwest counties, but the tillable acreage is still very great, probably in excess of 80 per cent.

Like that of central Kansas, the soils of this belt are retentive of moisture, and thorough shallow cultivation on land previously plowed very deep or subsoiled has given very surprising returns. What success has been attained in farming in seasons when the rainfall was deficient has been from this method—whether the crop was winter wheat or forage crops.

In some seasons, like those of 1891 and 1892, especially the latter, the soil, in its great wealth of fertility, gives phenomenal yields of grain. The rainfall of 1892 was seasonable, but less than that required for a fair crop east of the Missouri.

The climate of western Kansas is less arid than in days of range cattle; and its pioneer settlers believed that cultivation would have the same effect on the climate west of the one hundredth meridian that it had on the central region of the state. This may be possible to some extent, but two causes will prevent a change to the same extent as that noted in central Kansas: First, the greater elevation, averaging from 1,000 to 2,000 feet higher; and, second, an annual rainfall averaging one-third less.

From the experience gained in central Kansas, and from such evidence as we have before us, we must conclude that the agriculture of western Kansas is limited to what it can produce with the average annual rainfall it now has stored in the soil,

by means of deep cultivation first, to take it in rapidly and take it all in, and by shallow and repeated cultivation afterward, to prevent its waste by evaporation.

In the eastern part of the western belt the rainfall averages 20 inches, and in some seasons exceeds 25 inches. Wheat raising has been fairly successful in the eastern counties, averaging three crops out of five, and the average of the five crops per acre equaling many of the counties of the eastern belt, where the rainfall is double.

The northern counties, on head waters of the Republican river, have a greater annual rainfall than the counties south of the water shed between the Republican and Smoky Hill rivers, and have made good crops in seasons when crops were light in all of the western half of the state. The cause for this location being more favored than any around it cannot be definitely stated until data bearing on the question are collected, but topography of its surroundings and multiplicity and direction of its streams have probably some bearing on it.

Wheat has been the most successful and profitable grain crop yet raised in western Kansas. Broom corn can be grown in almost any season, and is both a successful and profitable crop. The forage crops, sorghum, Kaffir corn, and Soy bean, are as successfully raised in western as in central Kansas, and, excepting broom corn, are its most valuable crops, as well as most sure, because they make possible and profitable that business for which western Kansas is specially adapted, viz., cattle breeding. The native buffalo grass still cures on the ground for winter use in this belt, although not to the perfection it did when the buffalo were its consumers. Small herds of brood cows and young stock can be wintered on these native grasses during the open weather, and only need to be supplied with forage during the stormy days. This reduces the cost of wintering to such a small amount, as compared with eastern Kansas, that the latter cannot compete, and its farmers find it more profitable to buy feeding steers in western Kansas to convert their corn into beef than to raise them at home.

Cattle breeding, in connection with a limited amount of wheat raising and the raising of forage for winter feed, is the industry which insures to western Kansas the surest and the most profit. The decadence of the range-cattle industry makes necessary the building up of smaller brood herds, that can be sheltered and fed in stormy weather, to take the place of the southwest ranges in supplying the demand for feeding steers. At present, steers can be raised to two or three years of age at one-half their cost in eastern Kansas, or further east, where the feeding season is so much longer and winters are more moist and more severe. The small stock raisers, while breeding their herds, will be in a position to test the agricultural possibilities of their location without serious loss to themselves in event any crop should fail.

A limited acreage of wheat can be sown each fall, and, if the stand is not good in the spring, the same ground can be planted to forage crops with the loss only of the seed wheat. In seasons favorable to wheat, the yield will be far in excess of moist climates, for reasons already stated.

I have written only of the natural resources of western Kansas, or what can be done with the rainfall and conditions we find there to-day. There is, however, one feature of western Kansas to which brief reference should be made. Water is now being supplied through great irrigating ditches to quite a large territory along the Arkansas river, and in a more limited way along the tributaries of the Republican. Gardens and orchards are also irrigated by water raised by windmills from wells, where the depth is not too great. Irrigated farms are the most productive and valuable in the state, and the variety of products is endless. The main crop on irrigated farms, however, is alfalfa clover, which makes three and four crops each season, of 1½ to 2½ tons per acre for each crop. Without irrigation, alfalfa, well

set, produces two and three crops, yielding about one-half of the irrigated fields.

Improved farms, not irrigated, vary from $5 to $15 per acre; good land, unimproved, from $3 to $8; pasturage, from $1.25 to $4, according to grazing capacity.

LIVE STOCK.

A complete history of the agricultural development of Kansas must give prominence to its stock interests. The herds of range cattle, with their attendant cowboys, prepared the way for the pioneer farmer, by standing guard between the latter and the retreating Indians. The range-cattle industry, 25 years ago, was a prominent one in Kansas. The advancing tide of agricultural settlements from east to west forced the last of the range herds out of the state about five years ago.

Prior to occupation of the state by a farming population, cattle were wintered successfully in Kansas without any food being provided; then the climate cured the grass, fitting it for the winter use of the cattle as it had for the buffalo that preceded them. Since occupation and plowing of the ground, the winter value of the native grasses has so depreciated as to have but little value in eastern and central Kansas. This is especially true where the blue stem has taken the place of the buffalo grass, or wherever the former has encroached upon the latter. Where the blue stem now takes permanent hold the buffalo grass has not much value as a winter food supply. Buffalo grass cures most perfectly in an arid climate. Moisture promotes its growth, but fall rains injure its quality and prevent curing for winter use. This change of the grasses is one of nature's evidences of the climatic change that has taken place in central Kansas.

The flora of a country determines its fauna. Where we find corn in abundance, there we find cattle and hogs. Where we find buffalo grass, we find brood cattle or young stock cattle. Where we find blue-stem grass pastures, there we find beef steers prominent. Hogs thrive on corn, sorghum, and alfalfa; hence, we find them everywhere. Horses and mules are at home on buffalo grass or blue stem, and thrive equally well on the staple crops of all three belts.

Sheep were once handled in large flocks in central and western Kansas. Segregation was fatal to the sheep population, and low prices of wool to profitable handling. The number rapidly declined from 1880 to 1890. Smaller flocks, better management and better prices for wool and mutton have put the sheep industry on a solid and growing basis, and the sheep population is once more increasing. The price of mutton for the past two years has been of itself sufficient to give a fair profit to the flockmaster, without including the wool product.

The shortage of beef cattle in sight for the next four years will compel the use of mutton, pork and poultry to supply the deficit.

As we find differences in the farming and crops of the three belts, so we find differences in handling of live stock in each. At the eastern extreme we find all the products of an advanced agriculture, with corn and tame grasses both in abundance. Here the wild grasses afford about seven months of pasture. By supplementing with tame grasses, the season can be extended to nearly nine months. Stock cattle require to be fed three to five months, according to whether tame-grass pastures are used, and steers being fed for summer beef are usually six months in feed lot before turning out on grass.

At the extreme west of Kansas the buffalo grass still cures sufficiently to furnish food for cattle and horses, during the open days, all through the winter. Forage is provided only for the stormy days. Even as far east as the western part of the central belt the buffalo grass supplements the winter supply of food during the open days.

The wild grass of eastern Kansas is the blue stem; of western Kansas, the buffalo grass; in central Kansas, both grasses are intermixed. These variations of climate

and vegetation necessitate different methods of handling stock in the three belts.

In eastern Kansas good corn land and grass land are well distributed. At present, few steers are raised at home, the supply for feeding being shipped in from the ranges of the West and Southwest. A large proportion of these steers are full-fed, and shipped to market directly from the feed lot during the winter and spring months, but a larger proportion are fed all the corn fodder and other good forage they can eat and 20 to 30 bushels of corn per head.

Early in May these are turned into pastures to fatten for summer beef, and are shipped to market during August and September. The timber along the numerous streams of eastern Kansas specially favors the winter feeding of steers, and these, in connection with clover pastures, are specially adapted for the raising of stock hogs in summer to follow the cattle in winter.

Central Kansas, having more land in cultivation and less in grass, fattens a larger percentage than eastern Kansas in the feed lot, on full grain ration. Its healthfulness, its sandy soil affording good drainage, and its generally dry winters, favor the profitable feeding of both cattle and hogs.

The western half of the state is best adapted for breeding cattle, because of winter grasses, dry winters, plenty of cheap fodder, and, consequently, small cost of raising a steer ready for the feed lot. The reasons for this are already fully set forth in this article.

In 1892, Kansas produced over 70,000,000 bushels of wheat, equaling in product Iowa and Illinois combined (these two ranking second and third) in the wheat output of that year. Corn, in 1892, was below an average crop, and yet its value exceeded the value of the large wheat crop. This shows that beef and pork are the greatest product of Kansas, and that its live-stock interests exceed all other interests of its people.

The depression of the cattle industry from 1883 to 1892 brought great hardships to the farming interests of the state, and ruin to many individuals. The marked improvement in the state during the past year, concurrent with the improvement in prices of beef and pork, and the general belief that the supply of beef is short for many years to come, and hogs for at least two, is having a stimulating effect on all lines of business; for when cattle, hogs and sheep are paying Kansas is prospering.

The general belief that demand exceeds supply of beef in sight for several years to come is, we believe, well founded. Its first confirmation comes from the United States department of agriculture, which shows a reduction of 1,700,000 head of cattle in the United States in one year. This reduction is confined to beef cattle, the number of milch cows being practically the same in both years. Next year's report will probably show a still further reduction in number. It will take four years to increase the herds to equal the cattle population of 1892, and at least seven years to equal the number of beef cattle per capita that we had in 1892, based on an annual increase of 2 per cent. in our population during the present decade.

A brief review of the past 20 years of the cattle industry in the West will help us to a clearer view of this question of a short supply. From 1870 to 1883, cattle raising was a profitable business in the West, but especially on the ranges, where grass was abundant and free, taxes nominal, and expenses and losses light. Men had grown wealthy by the natural increase of their herds. Their success attracted the attention of capitalists, both in the United States and Europe, and the organization of large corporations to engage in the business became a craze. Female cattle were in great demand from 1876 to 1883 to stock these ranges, and prices advanced Everything was being held back from market but steers, and these till both old and ripe. Everything seemed to combine to advance prices of beef, and every advance created a demand for still more breeding and stock cattle. But a day of

reckoning came for cattle, young and old, on the range and on the farm. These accumulations of years must sometime find their way to the butcher's block, and from 1884 till 1892 the western states and territories have gone through a period of unloading.

The range demand for stock cattle created a great demand for blooded stock also to improve their herds. Many Kansas farmers competed with Missouri in supplying this demand, and when the tide in the affairs of range cattle turned from high to low prices, the breeding of pure-bred and high grade stock received a severe blow so far as values were concerned. Prices dropped from 200 to 300 per cent. in a few years on all pure-bred animals. Cows decreased in value 100 per cent. and upward from 1883 to 1891; steers, from 50 to 100 per cent. There were many large herds of brood cows in the state, and nearly every farmer had a small herd. When two- and three-year-old steers ready for the feed lot could be bought for 2½ to 3 cents per pound, as was the case from 1887 to 1892, the Kansas farmer could no longer afford to handle brood cows in competition with the ranches on the plains. In consequence, brood herds have practically disappeared from the state since 1889, except those retained for dairy purposes. Colorado, New Mexico and the panhandle of Texas ranges have supplied the Kansas farmers with most of their feeding steers since 1888, and, in recent years, of a quality almost equal to our native stock.

The range cattle men, and especially the incorporated companies, were quite as anxious to quit the business of breeding as were the Kansas farmers, but this they could only do by degrees. Steers could always find a market at some price, but cows could not be sold at all for breeding, and must be fattened. All the dry cows were shipped every season. During the past five years a large percentage of the female calves have been sent to market from the ranches north of central Texas and New Mexico. The spaying knife has been freely used in the range herds to stop breeding and insure fattening.

The cattle companies of to-day, in the range territory referred to, are not half in number those of 10 years ago, and the herds not one-fourth. In the same territory, the calf crop of 1893 will not exceed 15 per cent. of that of 1883. The breeding of range cattle on a large scale is now confined to southern half of Texas and New Mexico, and these are of a lower grade than the range steers the Kansas farmer has been feeding for the past 10 years.

When we remember that the farmers of Kansas and Nebraska were getting rid of their female cattle at the same time the ranch owners were reducing their herds, we can readily understand where the large supply of cattle that have been offered in Kansas City and Chicago for the past six or seven years has come from—flooding the beef market and at the same time reducing the number of brood cattle and the future output of steers. In the territory west of Kansas City, the number of steers over one year old has never been so few in 10 years as at this time. Cattle men have just awakened to this fact; and this spring cows that could be bought for $15 per head two years ago command $25 to $30 each. This demand and advance withdraw from market brood cows and female calves. Only fat steers will now come forward, if prices are maintained through this summer; and these, we believe, are not sufficient to overstock it, and must command a paying price.

I do not predict a famine for beef. High feeding and early marketing will supply part of the shortage. Pork and mutton can be increased rapidly, and poultry can be so increased in one year as to supply part of the beef deficiency. We do not anticipate as high prices as in 1882, but we predict that good corn-fed beef will rarely sell below $4.50 per 100 pounds in Kansas City, or half-fed cattle finished on grass below $4 per 100 pounds, during the next five years, and that prime beef will often reach $6 per hundred in the same period.

Kansas farmers are confronted with this problem at this time: An average annual corn crop of 150,000,000 to 200,000,000 bushels, which can all be converted into beef at home; a very small supply of available feeding steers in the state; a very much-reduced supply of good range feeding steers, by reason of large shipments to Montana ranges of yearling steers of the best brands.

Kansas farmers cannot longer depend on the supply of the past 10 years. The days of large range herds north of the 36th parallel are numbered. Small herds must take their place, giving a more certain and uniform supply.

Western Kansas is needed and is especially adapted for just this purpose. Oklahoma will, after a few years, supplement this supply; for the eastern half of Kansas can fatten more cattle than can be raised in a territory three to four times its own area. Home seekers with necessary capital find two phases of the cattle business in Kansas from which to make a choice. One, the breeding of cattle in western Kansas; the other, the fattening of steers in eastern Kansas. The former can be handled with less capital and experience than the latter.

One feature of Kansas live-stock interests has not been touched on, and that is the raising of pure-bred stock. Limestone has made the Teeswater country in England and the blue-grass region of Kentucky famous the world over because of the high development of their cattle and horses. Kansas has its limestone belt, and even the wild grasses on the limestone formation running north and south on the western edge of the eastern belt, through Greenwood, Chase, Morris, Wabaunsee, Geary and Riley counties, are producing cattle and horses noted for bone, muscle, fine frames, and strong constitutions. This is specially true where the water supply is from limestone-rock springs. Careful breeding for several generations on this formation shows a marked improvement on the native stock. The writer's attention was first attracted to this by noticing the marked improvement in the first generation bred from high-grade, native-Missouri cattle, which led to further investigation, and the conclusion that there was a great future for the grasses of this limestone belt in maintaining the good qualities of our high-bred animals, and possibly to further improve them on some points. The large size and hardiness of native cattle of this belt are quite noticeable.

The steady growth in numbers and the very marked improvements in quality show that Kansas climate and food supply are favorable to development of good horses. The shipping of horses to eastern markets is now a well-developed business, and some of the finest driving teams of our eastern cities are Kansas bred.

The official statistical tables published in this pamphlet give the number of each class of stock in Kansas for a period of years, from which the interested reader can quickly learn the gradual growth and relative importance of each. Kansas is essentially a stock country. Its favorable location and climate, its variety of soils and products, its convenience to good markets—all these combine to give it first rank in the breeding of horses and mules and in supplying the markets with beef, pork, and mutton, because no other state combines all the advantages to produce these so cheaply.

LARGE WHEAT YIELDS.

KANSAS in 1892 took first rank in wheat in the United States, not only in product grown, which was nearly 75,000,000 bushels, but also in yield, the latter being 18 bushels per acre on the entire area sown. In the last four years Kansas has grown three large wheat crops, and to show what the state is capable of doing with the right kind of farming in three years out of four, we publish below a few of the wheat yields for the years 1889, 1891, and 1892, respectively, representing the three belts of the state. The farmers making these reports are responsible parties, and if any further information is desired a letter addressed to them would no doubt receive prompt attention, the address of each being given.

EASTERN BELT—1889.

County.	*Name and post office.*	*Acres planted.*	*Yield, bushels per acre.*
Allen	J. H. Hall, Powhattan	120	31
Cowley	Wm. Crow, Arkansas City	10	42
Douglas	Lewis Churchlaugh, Willow Springs	150	33
Elk	Hugh Marshall, Oak Valley	81	40½
Franklin	Mundy & Parkinson, Pomona	500	25
Jackson	Israel McComas, Circleville	19	51
Jefferson	Jno. F. Goepfert, Perry	10	48¼
Leavenworth	August Kemerle, Millwood	40	35
Lyon	F. M. Chaffee, Wyckoff	70	36
Marshall	J. W. Means, Elm Creek	50	42
Morris	Tyson Jackson, Council Grove	63	35
Neosho	H. M. O'Bryan, Osage Mission	160	33
Osage	James H. Bryson, Michigan Valley	45	35
Pottawatomie	Warren Fulton, Onaga	18	54

EASTERN BELT—1891.

Butler	G. C. Wirth, Augusta	40	30
Chase	P. C. Jeffrey, Elmdale	85	29½
Coffey	B. F. Ward, Le Roy	30	30
Elk	C. W. Rambo, Elk Falls	100	30¾
Franklin	Wm. H. Moherman, Wellsville	17½	35
Greenwood	J. H. Jones, Toronto	15	41
Montgomery	John McFarlan	127	31¼
Osage	Max Buek, Burlingame	44	35
Riley	A. E. Huse, Manhattan	80	31
Shawnee	Thomas Buckman, Topeka	21	29
Wabaunsee	C. C. Gardiner, Bradford	34	30

EASTERN BELT—1892.

Brown	Geo. Joss, Hiawatha	15	41
Chase	Wm. Pinkerton, Clements	24	36½
Douglas	O. L. Cox, Lawrence	80	36
Franklin	J. S. Tulloss, Rantoul	20	30
Geary	H. A. Huston, Junction City	130	32
Johnson	S. S. McKee, Olathe	20	30
Leavenworth	David W. Sowers, Leavenworth	50	34
Marshall	C. B. Thummel, Axtell	50	33
Montgomery	Joseph Hannon, Elk City	20½	29
Morris	R. Drake, Council Grove	30	40
Nemaha	J. P. Good, Baileyville	17	35½
Riley	William Gugenham, Winkler's Mills	45	36
Shawnee	Thomas Buckman, Topeka	12	31½

CENTRAL BELT—1889.

County.	Name and post office.	Acres planted.	Yield, bushels per acre.
Barber	W. E. Campbell, Kiowa	160	35
Cloud	E. C. Davidson, Glasco	26	32
Ellis	Elihu Stout, Hays City	320	30
Ellsworth	J. P. Marker, Wilson	130	50
Harper	E. F. Burchfield, Anthony	20	42½
Harvey	David Lehman, Halstead	100	34⅛
Jewell	James M. Althouse, Formosa	20	37
Kingman	Charles B. Hardy, ———	10¼	37
Lincoln	George Woldint, Sylvan Grove	30	54¼
Marion	Fred. Schek, Marion	18	40
Ottawa	William Rehberg, Bennington	10	41
Republic	G. Ferguson, White Rock	8	40
Rush	J. J. Lewis, Timken	22	39
Saline	John W. Abbott, New Cambria	42	44
Stafford	R. M. Wallace, Freeman	5	44
Sumner	Bascom O. Hair, Hunnewell	207	34
Washington	William Lillibridge, Hanover	70	40¼

CENTRAL BELT—1891.

Cloud	G. W. Hussey, Glasco	100	29
Dickinson	W. S. Hart, Alida	18	30½
Harper	R. P. Ray, Harper	42	29
Jewell	P. R. Hoffer, Jewell	22	39
Mitchell	H. B. Woodbury, Cawker City	85	35
Osborne	William Black, Alton	27	41
Phillips	Jno. Hahnenkratt, Phillipsburg	46	43½
Pratt	W. P. McGill, Coats	10	33
Republic	A. Shaw, Belleville	20	31
Rooks	I. N. Pepper, Stockton	40	34½
Russell	W. H. Mead, Luray	40	40¼
Sedgwick	N. Covalt, Colwich	25	30
Washington	W. F. Hackney, Washington	20	41⅔

CENTRAL BELT—1892.

Cloud	S. Worres, Concordia	32	36
Comanche	William Pepard, Wilmore	40	30
Dickinson	T. C. Iloff, Talmage	15	45
Ellsworth	O. W. Olson and S. W. Gile, Venango	300	36½
Harvey	John D. Dreese, Halstead	288	30
Kiowa	Swan Anderson, Wellsford	155	27
Lincoln	Geo. P. Metzger, Bayne	20	53
McPherson	James Anderson, Roxbury	180	32
Mitchell	W. S. Chappell, Asherville	60	40
Osborne	G. W. Gorman, Kill Creek	11½	43
Ottawa	S. S. McPherson, Lindsey	110	37
Pawnee	A. Gingrich, Larned	160	31½
Phillips	W. M. Deeming, Logan	70	40
Pratt	Thomas Edwards, Coats	75	35
Republic	W. E. Day, Narka	178	30
Rice	W. F. Lowery, Lyons	85	30
Rooks	George Jeffrey, Stockton	30	35
Russell	John Lilak, Wilson	5	50
Smith	S. Love, Harlan	31	48
Washington	W. F. Hackney, Washington	40	39

WESTERN BELT—1889.

County.	Name and post office.	Acres planted.	Yield, bushels per acre.
Clark	Emmet Berry, Ashland	26	33
Decatur	T. W. Holcomb, Allison	10	25
Finney	I. L. Diesem, Garden City	4	35
Logan	John David, Russell Spring	140	28
Ness	John Scherzinger, Ransom	77	42

WESTERN BELT—1891.

County.	*Name and post office.*	*Acres planted*	*Yield, bushels per acre.*
Ford	C. M. Beeson, Dodge City	15	40¼
Gove	B. S. Eldred, Gove City	120	28
Graham	S. Garrison, Penokee	15	35
Gray	Benton Heath, Ensign	26	24
Greeley	E. J. Everett, Astor	20	25½
Kearny	Geo. Wagner, Kearny	25	26
Ness	John Scherzinger, Ransom	35	27
Sheridan	E. H. Lupton, Hoxie	90	30
Sherman	C. R. Deatherage, Edson	10	28
Wichita	A. K. Bashum, Leoti	11	36

WESTERN BELT—1892.

Clark	C. F. Winton, Ashland	91	38
Finney	Jas. S. Griggs, Garden City	80	31
Ford	A. L. Crawford, Dodge City	50	30½
Graham	B. F. Blackman, Skelton	10	39
Gray	E. E. Bowers, Ingalls	48	31¼
Haskell	S. Derby, Santa Fé	20	35
Hodgeman	Robert McNabney, Laurel	50	30¾
Kearny	Seigel Carr, Lakin	10	65
Meade	Hugh L. Mullen, Fowler	43	32
Morton	Marsh Whitelaw, Richfield	25	32
Rawlins	Geo. Preston, Blakeman	60	36
Seward	H. V. Tucker, Liberal	20	30
Stevens	—— Jackman, Woodsdale	70	40

ALFALFA CLOVER.

BY JOHN H. CHURCHILL, DODGE CITY, KAS.

Of all the forage plants, this is the most valuable to the western and central Kansas farmer, and its cultivation should deeply interest every man who owns an acre of bottom land, or land under irrigation canals. It should interest every farmer in the west half of this great state, whether his land lies on the high plain or lower valley, for I am persuaded, by observation and experience, that the year it will not produce two good crops on high land your other crops will prove a failure. There is no crop that will bring so great and sure a return for the investment as this; for blow the winds high or low, be the season dry or moist, alfalfa on bottom lands, or land under irrigation, grows night or day from the middle of April till November 1. Four crops can be cut in an ordinary season. On the high lands, outside of irrigation, two crops can be safely relied on.

Alfalfa, if the information I have received is correct, was first introduced into California some 40 years ago, from seed imported from Chili, South America, where there are said to be fields 100 years old. It has been gradually making its way eastward since its introduction into this country, where its value for a forage and seed crop was quickly realized. It spread through the valleys of California, crossed hill and mountain into the valleys of dry and sterile Arizona, through Utah, crossing the Rocky mountains. Here and there it gained a strong foothold along the settled valleys of the Rio Grande and Arkansas. About 1880 its name and fame reached the west border line of our state, and its onward and eastward march since then has been one continual victory. Passing over the A. T. & S. F. R. R., from Dodge City west to the state line, thousands and thousands of acres of the bright purple-blooming alfalfa can be seen.

Does it pay? It would seem so, when you see the golden seed coming from the threshing machine, worth $5 per bushel, and from four to seven bushels to the acre. Does it pay? It would seem so, when you look over your fields, after the last cutting and stacking, and see the great ricks of hay, one after the other; and later, when you bring your cattle home, and turn your steers into the fields to graze on the pasture and run to the stacks for a month or two; when a cattle buyer comes along, and, seeing the sleek, well-filled and rounded-out steers, offers you, right at home, more money for them than you can get in Kansas City, or any other market, and within a small fraction of what grain-fed cattle are bringing. We believe it pays.

It does pay, and pays well; and once rooted on the rich bottom lands or high plains, it is a perpetual source of income. No planting, cultivating, or seeding; only the pleasing task of harvesting, and to-day alfalfa stands high above all other crops for profit. Easy of culture, and as a sure return for the investment, it has no peer. It is not hard to get this plant started, and after the first year it takes care of itself.

From my own experience, I find the best time for planting to be from March 15 to April 20, and the older and deeper stirred the ground, the better. It should be stirred the preceding fall. When the seeding time comes, in March or April, oats or barley should be sown first, drilled or broadcast, one-half bushel to the acre, then

alfalfa, 20 pounds to the acre, broadcast, which should be lightly harrowed, and, if the ground be loose, a rolling is advantageous, as the ground will hold moisture better, and leaves the land smooth for machinery to work on.

The oats or barley will grow faster than the alfalfa, and protect the young and tender plant from the high winds. After the grain is cut, the plant is able to care for itself, and, in an ordinary season, will produce a fair crop of hay in the latter part of August, and furnish a good pasture through the fall. This has been my experience and that of many of my friends who have successfully grown this wonderfully productive and paying crop.

Alfalfa should be cut for hay when in full bloom, when the blossom is the sweetest. It should be raked into windrows as soon as possible and cured sufficiently, so that it will neither burn or get musty in stack or stable, and it will be as green in the winter as when first put up. As a milk-producing forage it is simply wonderful, and has no equal, and the butter from alfalfa-fed cows is rich in color and quality. Even the farm fowls will fly over drifts of snow to pick the green leaves scattered around an open stack. Musty alfalfa, or the bottom of the stack when mildewed or white, or the top of a stack when damaged by rain, should under no circumstances be fed to horses, as it will probably result in a case of heaves. Cattle will eat everything. Stock should be kept off of alfalfa fields from May till after last cutting, as there is danger of bloat. In the fall, after the last cutting, there is no danger apparently. The roots of alfalfa are porous and go down to moisture. I have never had the patience to ascertain the depth they do go down, but certainly from 10 to 16 feet; and there is the secret of its continual growth in the dryest weather. The roots so deeply and strongly set draw nourishment from many feet below the surface, and, notwithstanding its wonderful productiveness, its does not impoverish the soil. On the contrary, it enriches, as has been proved by old fields that have been plowed up. The crops of potatoes on such fields, I am told, have been remarkable, the decaying roots being equal to any fertilizer—and better, for the fertilizer is down at the roots.

In converting new ground into alfalfa fields, do not be too hasty. Plow the sod, and plant it to corn with a hand planter. In the fall, cut the ground with a disc, and sow to wheat. Next year, in the fall, or after harvest, stir deep as possible. The idea is to get all the wildness out of the soil, and weed roots killed, and the ground loosened as deep as possible; then you have the ground in the condition for the best results. I do not advocate sowing until the third season from breaking. The early spring is the best time for sowing, under all circumstances; though, where irrigation is possible, it can be successfully sown through the summer till September. The spring rains enable the plant to root well before very hot or dry weather; and, altogether, the results are the best for early sowing.

There may come times when we look, long and anxiously, for clouds; for rain that never seems to come; but we no longer feel as formerly, that this season is a failure, for drouth is robbed of part of his terrors—despair. When all else fails, our bright, green fields of alfalfa are with us. It will start you on the road to prosperity sooner than any other crop. If you are so unfortunate as to be afflicted with that peace-destroying accommodation of the money loaner called a mortgage, it will give you the means to lift it quicker than any other crop.

There are many ways out; many ways to attain success in this great state of Kansas, for she has wonderful possibilities. Each year brings new surprises of the marvelous productiveness of her soil; of the energy and push of her people. She ranks to-day, year in and year out, the first grain-producing state in the union. Her people, coming from every part of our common country, neither know nor want any other home but Kansas; and the way out to success in this fair state of ours is

by work—noble, manly action. Raise those crops which are assured. Alfalfa, in connection with stock raising, is one of the royal roads to the way out—to success and prosperity. Raise alfalfa. Do not fear an overproduction. A time will come—it certainly will, as sure as the sun rises in the east—when every valley will have its purple-blooming fields; when every farm, either upon the high or low lands, will be incomplete without its 30, 40 or 50 acres of alfalfa. When that time comes, we will have the richest state in the union; we will be the happiest and most prosperous farmers in America.

Now, in conclusion, I have only this to add: I have no axe to grind—no seed to sell, or land adapted to alfalfa growing to put on the market. I am not talking alfalfa for any selfish or personal interest. The only interest I have is the development and prosperity of Kansas; the success of her people. We have come to this state to make a success, and myself and others have found a way to an added prosperity, and it is my purpose and duty to give it to you, without exaggeration—just the plain facts—and I have done so. It is alfalfa! king of crops! clad in purple and green. He beckons to you, to me; welcomes the farmer to his dominions; points the way to a new success and happiness.

REPORTS OF KANSAS FARMERS ON ALFALFA CLOVER.

Alfalfa is found to be a very valuable crop in central and western Kansas, taking the place of clover and other tame grasses. To show that it is successfully grown in western Kansas, farmers in different sections were asked to report to this Board the result of their experience in growing the crop. The following are the reports:

Barber County. J. P. Hall, Medicine Lodge.—Have grown alfalfa 10 years, and now have 40 acres on second-bottom land. I prepare the ground in the same way as for wheat; sow not less than 20 pounds of seed per acre, and cover it with a light harrow. I would recommend sowing seed about the first of May. During the first year the crop is more valuable for pasture than for hay. After the first year, I cut for hay from three to five times. The first cutting generally makes one ton per acre, the crop growing lighter each time. There is no better hay, and it is the best for milch cows. I have never saved any seed, but have paid as high as $8 per bushel. The value of the total product of alfalfa hay and seed an average year is from $12 to $15 per acre. I have pastured 150 hogs on 20 acres for seven months, with 1½ bushels of corn per day, and they did well. Alfalfa will thrive on most any kind of soil in the western half of this state.

Barton County. W. I. Carson, Heizerton.—Have grown alfalfa 14 years, and now have 70 acres growing on bottom land. I sow the seed in the spring, using from 20 to 30 pounds to the acre. If the season is favorable, two crops of hay may be cut during the first year. From three to four cuttings can be made during the season after the first year. The yield is from three to five tons in the aggregate. Value per ton, $8; prairie hay, $5. I cut the second crop for seed; the yield is from six to nine bushels per acre; value per bushel, $4. The value of total product of hay and seed an average season is about $40. If the alfalfa is not cut, one acre will afford good pasture for 20 head of hogs from April 15 to December 1. Would not advise sowing alfalfa on clay subsoil upland.

Chase County. J. R. Blackshire, Elmdale.—Sixteen years' experience in growing alfalfa. Have now on bottom land 450 acres. I make the seed bed mellow and smooth, and sow not less than 20 pounds of seed per acre, in March and April. During the first year the crop is of value for pasture or hay; afterward I cut from two to three times during the season. For the last 10 years, I think the average yield has been five tons per acre. It is worth much more than prairie hay; the de-

mand governs the price. The yield of seed per acre is from three to five bushels. I am delivering mine on cars for $5 per bushel. Alfalfa will thrive on upland with clay subsoil if there is no hardpan.

Clark County. C. D. Perry, Englewood (under irrigation).—Three years' experience in growing alfalfa. Have now, on bottom land, 350 acres. I would recommend spring sowing, from March 10 to April 15; the last week in March is preferable. I plow and thoroughly pulverize the ground, drill the seed with a press drill, eight pounds per acre, both ways of the land. Have had good success on sod land, broken three inches deep, well harrowed. Seed sown broadcast, averaging 20 pounds per acre, well harrowed in and rolled. The fall seeding winterkills. The value of crop for pasture or hay, the first year, depends upon the amount of moisture. I cut the crop from three to four times, getting from one to two tons at each cutting. I consider it the best hay grown. I feed all that I raise. The third cutting is best for seed; worth now $3.50 per bushel. One acre of alfalfa, if not cut, will pasture 10 hogs, young and old, for nine months. I would not recommend sowing alfalfa on upland clay subsoil in central or western Kansas.

Cloud County. J. E. Fitzgerald, Jamestown.—Have grown alfalfa for five years. Have now on stony upland 120 acres. I sow the seed in early spring. I plow the ground deep; sow from three pecks to one bushel of oats to the acre, harrow once, then sow 12½ pounds of alfalfa seed per acre, shorten the harrow teeth, and harrow twice and roll once afterwards. The crop will stand light pasturing the first season. The crop will bear cutting twice during the second year and three times the third, making good fall pasture both years. Until this winter there has been no demand for alfalfa hay, as farmers have not become acquainted with its merits as hay. I think one ton of alfalfa is worth as much at three tons of prairie hay. I cut first crop for hay during the first week in June, second crop the last week in August. The crop of third cutting depends upon the rainfall during the season. I only cut 25 acres for hay last year and from the three cuttings I got 127 tons. The second cutting was thrashed, from which I secured 85 bushels of seed. The straw after being thrashed is much better feed for cattle and sheep than the best prairie hay. The value of the total product of alfalfa hay and seed per acre is $30 an average year. Any kind of land on which water will not stand will produce alfalfa. I expect to sow an additional 60 acres this year.

Finney County. O. V. Folsom, Garden City.—Have had eight years' experience in growing alfalfa. Have now 45 acres growing on upland. In preparing the ground for crop, the plowing should be deep and pulverizing thorough. I sow the seed during the last week in March or the first week in April, and sow 25 pounds to the acre. I consider the first year's crop of value for hay and pasture. After the first year the crop may be cut for hay four times during the season, averaging 1¼ tons each time. If seed is saved, then cut but twice. Alfalfa hay is much more valuable as feed for stock than prairie hay. The average yield of seed per acre is about five bushels. Value per bushel, $3.50. Total value of product in hay and seed, $22.50 per acre.

Garfield County. Dr. O. W. Crow, Eminence.—Have grown alfalfa for five years, and now have 10 acres on bottom land—old ground. I plow the ground deep, pulverize it thoroughly, and level it with a heavy roller. I sow the seed either with a drill, or broadcast it, and cover it with a slant-tooth smoothing harrow; using from 20 to 30 pounds of seed per acre. I consider the crop of value both for hay and seed during the first year. I cut twice a year for hay and once for seed after the first year. I get from one to 1½ tons per acre at each cutting. Alfalfa hay is worth from $5 to $7 per ton; prairie hay from $3 to $5 per ton. I cut for seed during September, and get on an average four bushels per acre. The seed is now worth $4.50 per bushel. The value of total product of hay and seed has averaged me $20 per acre.

Grant County. M. Shockey, Shockey.—Have had three years' experience growing alfalfa. Have now 10 acres on second-bottom land. In preparing for a crop, I plow deep, first sow oats, then the alfalfa, and cover it with a light harrow. I sow the seed during the first two weeks in April, using about a peck to the acre. Occasionally, the crop during the first year is of value for pasture or hay. After the first season I cut the crop twice, the yield varying from two to four tons per acre. Alfalfa hay is worth twice as much as prairie hay for feed. The third cutting is best for seed. The value of the total product of hay and seed per acre is from $25 to $30. Bottom land is preferable to grow alfalfa on.

Gray County. E. E. Bowler, Pierceville.—Have had five years' experience in growing alfalfa, and now have 250 acres on bottom land. Before sowing, the sod should be well rotted, and the ground smooth. Sow broadcast or with a drill; if sown broadcast, harrow lightly. I sow 20 pounds to the acre, and sow in the spring, preferring the month of April. After the first year I cut four times during the season for hay, and get 1½ tons per acre at each time. Its value is twice that of prairie hay. The average yield of seed per acre is five bushels. I cut the second crop for seed, about August 10. The seed is worth now about $3 per bushel. The total product of alfalfa hay and seed per acre is $20 to $25. I would not recommend sowing alfalfa on upland with clay subsoil.

Hamilton County. Alfred Pratt, Syracuse.—Have had six years' experience in growing alfalfa. I have now 100 acres of it on bottom land. I sow the seed in the spring, as soon as danger from frosts is past, say after April 1. In preparing the ground for a crop, I plow either early in the spring or during the fall, and after thoroughly pulverizing the ground I sow about 15 pounds of seed to the acre, covering it lightly with a harrow. In this locality, under irrigation, the crop the first year is profitable either for pasture or hay. I cut the crop three times during the season, after the first year—June 1 for hay, August 1 for seed, and again September 15 for hay. The second cutting is valuable also for hay, after being thrashed. The three crops will make about five tons of hay per acre. Alfalfa hay has never sold in this county for less than $6 per ton, sometimes as high as $10 per ton. It is far superior to prairie hay. Stock of all kinds will fatten on it, and excellent beef is made from it also. This is the first year that the seed crop was saved in this county. I think it averaged five bushels of good quality per acre, and has sold for $3.50 per bushel, which is the lowest I have ever known seed to sell. At present prices, the value of the total product of alfalfa in hay and seed will run about $35 per acre. Would not recommend sowing alfalfa on upland with clay subsoil.

Kearny County. William Sharp, Lakin.—Have now 80 acres in alfalfa. Have had four years' experience in growing it. In preparing for a crop I plow the ground deep, and harrow it until smooth and fine; sow the seed about April 1, using 20 pounds per acre. I find it preferable to sow alfalfa and oats together with a drill. The crop the first year may be cut with profit after the oats have been taken off, and will furnish good fall pasture. After the first year, I cut four times, getting from one to two tons per acre each time. The average price per ton is now $4. One ton of alfalfa hay is worth two of prairie hay for feed. The average yield of seed per acre is about six bushels. I cut for seed during the first two weeks in August. Price per bushel now, $4. The value of crop in hay and pasture an average year is $44. Would not recommend sowing alfalfa on upland with clay subsoil.

Meade County. R. E. Steele & Co., Meade.—Have grown alfalfa five years, and have now 300 acres growing on bottom land. In preparing the ground for a crop, it should be plowed deep and harrowed until it is smooth and mellow. The best time for sowing the seed is from the 1st to the 15th of April. I sow one-third of a

bushel per acre, and cover it with a harrow, During the first year the crop is not valuable for hay, but makes fine pasture in the fall. I always cut the crop four times. The last crop is a light one. From the four cuttings I get from five to six tons of hay per acre. One ton of alfalfa hay is worth as much as 20 bushels of corn as a fat producer. The average yield of seed per acre is six bushels. I cut the first crop for seed. The seed is worth at this time $3.50 per bushel. The net value of crop of hay and seed per acre is about $24. Alfalfa does not do well on any kind of upland in this county.

Mitchell County. David Smith, Beloit.—Have had ten years' experience in growing alfalfa, and now have 32 acres on bottom land. It is best to plow the land during the fall, and to sow the seed during the last week in March or the first week in April. Cover the seed with a harrow, and then roll the ground. I sow 15 pounds to the acre. The crop will make good hay the first year. It is worth one-fourth more than prairie hay to feed stock. The price per ton ranges from $6 to $8. The yield of seed per acre is from four to seven bushels, depending on the season. The crop should be cut for seed as soon as the pods become brown. The value of the total crop of alfalfa, in hay and seed, is from $35 to $45. If the crop is not cut, 15 or 20 hogs will thrive and do well on one acre for six months of an average year.

Osborne County. T. J. Durfey, Bristow.—I have now 35 acres of alfalfa on upland and bottom together. Have had three years' experience in growing it. I plow the ground deep as possible, harrow and pulverize thoroughly, and sow during April from 25 to 30 pounds of seed per acre. I use the harrow to cover the seed, and the roller afterwards. The crop of the first year is fit for late feed only. After the first year I cut two or three times, depending on the season, and get from two to three tons at each cutting. I have never sold any alfalfa hay, but I consider it of more value for feeding stock than either timothy or red clover. The average yield of seed per acre is five bushels. The second cutting yields the best seed. The price now is $5 per bushel. Alfalfa will do well on upland with clay subsoil.

Pawnee County. J. G. Payne, Larned.—Have grown alfalfa five years. Have now growing 40 acres of it on bottom land. I prepare the ground for a crop in the same way as for oats; sow the seed broadcast, 20 to 30 pounds to the acre, and cover it with a light harrow. The crop is of value for both hay or pasture during the first year. After the first year, with a reasonable amount of rainfall, the crop may be cut three or four times, yielding from two to four tons at each cutting. The value of alfalfa hay is two-thirds greater than that of prairie hay for feeding stock. I have seen good crops of alfalfa growing on upland with clay subsoil.

Rawlins County. M. A. Wilson, Atwood.—Have grown alfalfa six years. Have now growing 14 acres on first bottom and 12 acres on second bottom. To secure a good stand, the ground should be plowed very deep and pulverized thoroughly. I sow the seed with spring wheat, using from 20 to 24 pounds to the acre. I do not consider the crop of value for pasture or hay the first year. The first year I cut the wheat, second year the alfalfa. After the first season I cut for hay three times, getting about 1½ tons of hay per acre each time. The price varies from $12 to $15 per ton. I consider its value one-third more than prairie hay. I cut the crop for seed about July 1. The yield ranges from three to four bushels per acre. The price per bushel is about $4. The value of total product of hay and seed an average year is about $40. One acre of alfalfa, if not cut during the season, will pasture 10 hogs about six months. Would not recommend growing alfalfa on upland with clay subsoil in northwestern Kansas.

Reno County. Wm. E. Hutchinson, Hutchinson.—Have had three years' experience in growing alfalfa. Have now 55 acres on bottom land. I sow the seed in the

spring, avoiding the hard winds and late frosts. I sow about 20 pounds to the acre, and cover it with an acme harrow. In preparing for a crop, the ground should be plowed deep twice, in narrow lands, with deep furrows between to prevent water from standing on the ground in the winter or spring, During the first year the crop may be pastured lightly with cattle and horses, but not with hogs, as they eat the roots. I am using my alfalfa exclusively for pasture. Fifteen full-grown hogs may be pastured on one acre from April 30 to Christmas, an average season, if the stand is good. Would sow alfalfa on the best of ground, but it will grow on poor land.

Rooks County. George Foxall, Woodston.—Have had eight years' experience in growing alfalfa. Have 30 acres on bottom land. I have always sowed the seed in April, 20 to 30 pounds to the acre, covering it with a harrow. It will not do to cut the crop the first year. It may be cut from three to four times during the season, after the first year. The yield of seed is from three to five bushels per acre; value, $5 per bushel. Value of total product of seed and hay, $30 per acre.

Sedgwick County. W. T. Jewett, Wichita.—Five years' experience in growing alfalfa. Have now 50 acres growing on second-bottom land. I prepare the ground in the same way as for red clover. Sow not less than 30 pounds of seed per acre, and cover with a harrow. The best time to sow is during the last two weeks in March. The crop is not generally good for hay or pasture during the first year. After the first season, I cut from three to four times for hay, depending upon the rainfall. The yield is from four to six tons per acre, in the aggregate. For feeding stock of any kind, alfalfa hay is worth twice as much as prairie hay. The yield of seed per acre varies from five to seven bushels. An average season the value of total product of alfalfa in hay and seed is $30 per acre. Alfalfa will grow on any kind of land that will produce an average crop of corn.

Sherman County. Charles H. Barlow, Goodland.—Have been growing alfalfa between two and three years. Have now on upland 70 acres of it; some of the stand is on first breaking, and some on land that has been in cultivation three years. I sow the seed about March 1; one-half bushel to the acre. During the first year the crop makes good pasture. Have always pastured my alfalfa; I never cut for hay. Alfalfa hay is considered equal in value to red clover hay. I think my stand of alfalfa now would furnish, per acre, pasture for 20 head of hogs for seven months. Would recommend sowing alfalfa on any kind of soil.

Stafford County. Henry Rohr, St. John.—Have had two years' experience with alfalfa. Have now 38 acres, 18 on bottom land and 10 acres on upland. I prefer early fall sowing for this portion of the state. If I sow in the spring, I plow just before seeding, about April 1, and then harrow. If in the fall, list the wheat, rye or oat stubble in corn for fodder, cultivate once or twice, then sow the seed during the last two weeks in August. In the fall I sow 20 pounds of seed to the acre, and in the spring I sow 25 pounds. I have not cut for hay yet, but expect to this year. After pasturing, I cut the crop twice to keep down the weeds. I pastured 150 head of good-sized shoats on 18 acres sown during the spring, from August 25 until frost came, and they thrived well. Would recommend sowing alfalfa on upland and clay subsoil.

Wallace County. M. T. Griggs, Wallace.—Have had three years' experience in growing alfalfa. Have now on bottom land under irrigation 32 acres. For a crop of alfalfa, the ground should be prepared the same as for wheat. During the month of April is the best time to sow the seed. I use about 25 pounds to the acre. During the first year the crop is of value for hay or pasture when under irrigation. I cut three times during the season after the first year. I sold my hay for $8 per ton.

SORGHUM IN KANSAS.

BY PROF. C. C. GEORGESON, STATE AGRICULTURAL COLLEGE, MANHATTAN.

THE many varieties of sorghum may conveniently be classed under two general heads, namely, sugar-bearing sorghums and non-sugar-bearing sorghums. The first group covers all those varieties which contain sugar, many of which are rich enough in that substance to make their culture profitable for the sugar factory. The list numbers hundreds of varieties, and is constantly augmented by new sorts produced by chance and by artificial crossing. All of them do well in Kansas. Extensive plants for the manufacture of sugar from sorghum have been erected in several places in the state, and their successful operation gives the best possible proof of the adaptation of the climate and soil of Kansas to the production of this crop. The fact is so well known to the public at large that it is unnecessery to dwell upon it here. But while all varieties can be grown here, they are not all equally profitable. The Kansas Experiment Station has for several years past experimented in testing varieties, with a view to ascertain which were richest in sugar. These tests have involved numerous analyses, and by rejecting all but those which showed a high per cent. of sugar in the juice, the list has been purged of all inferior kinds. Moreover, by selecting seed from the cane richest in sugar of each variety, Professor Failyer has succeeded in increasing the per cent. of sugar in several kinds in a marked degree. More than 20 per cent. of cane sugar has thus been obtained in some instances, and over 19 per cent. in others. For details on this interesting subject, the reader is referred to Bulletin No. 36 of the Kansas Experiment Station.

Profitable culture of sorghum for sugar demands a consideration of several points: First, the quality of the cane as regards the per cent. of sugar; second, the yield per acre; third, the keeping qualities of the cane and early maturity, so as to secure a long working season; and fourth, the quantity and quality of leaves and seed as feeding materials. All of these points should be closely studied in the selection of varieties for sugar production.

But valuable as the sorghum plant is for sugar, it is of still wider usefulness, and therefore of greater general interest, when viewed as a forage plant, and it is more especially to this feature that I beg leave to call attention. Both the sugar-bearing and the non-sugar-bearing varieties take high rank as forage plants. The best kinds yield seed which is equal to corn as feed for cattle and swine, and their forage is rather better than corn stover, or the feed afforded by the corn plant after the corn is husked, and all varieties of sorghum alike have this very important advantage over corn, that they can better stand drouth, and therefore a total failure of the sorghum crop is a rare occurrence even in very dry seasons.

When it comes to a choice between the two classes of sorghum for forage, I place the non-sugar-bearing varieties first, because they as a rule not only bear more seed than the sweet sorghums, but also more foliage, though when grown thickly for fodder only, without regard to the seed, there is no difference between the best varieties in either class. In western Kansas, where the short buffalo grass affords but little hay, it is a common practice to sow sorghum seed, either broadcast or with a drill,

and mow the crop for hay, and four tons to the acre of such hay is not an unusual yield. The small, sweet variety, called the early amber, is frequently used for this purpose, because the stalks are small and branched and easily cured.

As a grain crop, the non-sugar-bearing varieties are the best yielders; as, for instance, the kinds known as red and white Kaffir corn, Jerusalem corn, and milo-maize. The yield on good upland, and without irrigation, and with such culture as would be required for a corn crop, will vary with the season from 20 to 80 bushels of seed per acre. Red Kaffir corn has reached the latter figure here at the agricultural experiment station, in a year with normal and well distributed rainfall, and Jerusalem corn has given the former yield in an unusally dry season on upland without irrigation, at the United States Grass Experiment Station near Garden City, in the western part of Kansas.

As to the feeding qualities of the seed, it has been proved by repeated experiments that it is equal to corn. With such facts before us, it is a question if it would not be the better part of wisdom to increase the area in those varieties of sorghum which are grown chiefly for the grain, and correspondingly decrease the area in corn over the entire region of the West where the corn crop is likely to be cut short every few years from a deficiency in the rainfall.

Although sorghum seed has been found to be good feed, there is some choice as to quality. All kinds of stock relish the light-colored seed the most. The dark-colored and black seed, from the large amount of tannin in the hulls, has a bitter or astringent taste that renders it objectionable. The light-colored kinds are free from this. Other things being equal, the white-seeded varieties are therefore to be preferred when grown for the grain. But, on the other hand, the white-seeded varieties that are so far known fall behind some of the others either in earliness or in yield. All things considered, I place the red Kaffir corn first on the list of important varieties. Upwards of 200 varieties have been tested here at the experiment station, and, as a substitute for corn, none was superior to red Kaffir corn. The grain, although red or light brown, is not appreciably astringent, and is much relished by stock. The plant is low and stocky, and does not readily blow down; it has an abundance of large foliage, of good feeding quality; it yields more grain and almost as much fodder as any other kind tested, and it matures early enough to escape injury from frost in Kansas. Next to this I would place Jerusalem corn. It does not yield so much of either seed or forage as the red Kaffir corn, but the grain is white and of superior quality, and the plant resists drouth well. Third on the list I would place white milo-maize. It is a large, vigorous plant, which produces a heavy yield of forage, and a fair yield of white grain of excellent quality. Its chief drawback is, that it does not mature early enough to escape injury from frost every year. The fourth place I would assign to white Kaffir corn. It yields less forage, but as much seed as the preceding, and is of equal feeding quality. It, too, is often injured by frost in this latitude before the grain matures. For the combined production of grain and forage all other sorts rank after these in Kansas.

The culture of these sorghums is essentially like that of corn. Whether for grain or forage, they are best grown in rows far enough apart to admit of cultivation, except as a hay crop, when the seed should be drilled closely or broadcasted.

TABLE showing analysis of corn. (Connecticut Experiment Station.)

KIND AND CONDITION.	*Dry matter.*	*Protein.*	*Crude fat.*	*Nitrogen-free extract.*	*Fiber.*	*Ash.*
Green corn fodder	19.02	1.63	.41	10.62	5.23	1.13
Corn fodder—field cured	65.02	4.23	1.08	33.79	21.27	4.65
Dry corn stalks	90.43	5.02	1.10	49.17	29.92	5.23
Corn kernels of Dent corn	89.91	10.33	5.10	70.66	2.28	1.54

TABLE showing composition of plants cut at different periods of growth. (Kansas Experiment Station.)

KIND AND CONDITION OF PLANT.	IN THE AIR-DRY SUBSTANCE—per cent.										
	Water	Dry matter.					Total dry matter	Total nitrogen	Albuminoid nitrogen	Nonalbuminoid nitrogen	Pure albuminoids
		Ash	Crude protein	Crude fiber	Nitrogen-free extract	Crude fat					
Kaffir Corn—fodder:											
Seed in soft milk	7.37	9.08	7.99	31.41	41.96	2.19	92.63	1.28	.95	.33	5.97
Seed in soft dough	6.08	8.41	6.84	32.77	44.28	1.62	93.92	1.10	.84	.26	5.23
Seed in hard dough	9.75	9.13	6.83	30.17	42.04	2.08	90.25	1.09	.85	.24	5.31
Seed hard, easily split	7.13	8.93	6.08	31.55	44.56	1.75	92.87	.97	.85	.12	5.31
Seed hard, nearly dry	8.67	7.82	5.35	30.68	45.80	1.68	91.33	.86	.70	.16	4.38
Kaffir Corn—grain:											
Seed in soft milk	10.02	2.06	13.72	2.72	68.91	2.57	89.98	2.19	2.15	.04	13.44
Seed in soft dough	9.37	1.77	11.22	2.00	72.64	3.00	90.63	1.80	1.81	.....	11.31
Seed in hard dough	9.89	1.73	11.19	1.65	72.94	2.60	90.11	1.79	1.76	.03	11.02
Seed hard, easily split	9.70	1.59	10.78	1.54	73.14	3.25	90.39	1.73	1.70	.03	10.60
Seed hard, nearly dry	9.31	1.69	10.94	1.49	73.30	3.27	90.69	1.75	1.73	.02	10.81
	IN THE DRY SUBSTANCE—per cent.										
Kaffir Corn—fodder:											
Seed in soft milk	.....	9.80	8.63	33.91	45.30	2.36	.....	1.38	1.03	.35	6.44
Seed in soft dough	.....	8.95	7.28	34.89	47.16	1.72	.....	1.17	.89	.28	5.57
Seed in hard dough	.....	10.12	7.56	33.43	46.59	2.30	.....	1.21	.94	.27	5.89
Seed hard, easily split	.....	9.61	6.55	33.97	47.99	1.88	.....	1.05	.91	.14	6.71
Seed hard, nearly dry	.....	8.56	5.86	33.59	50.15	1.84	.....	.94	.77	.17	4.82
Kaffir Corn—grain:											
Seed in soft milk	.....	2.29	15.24	3.02	76.58	2.87	.....	2.44	2.39	.05	14.93
Seed in soft dough	.....	1.95	12.38	2.21	80.14	3.32	.....	1.98	1.99	.....	12.48
Seed in hard dough	.....	1.91	12.42	1.83	80.95	2.89	.....	1.99	1.96	.03	12.23
Seed hard, easily split	.....	1.77	11.94	1.71	80.98	3.60	.....	1.91	1.88	.03	11.74
Seed hard, nearly dry	.....	1.86	12.06	1.64	80.83	3.61	.....	1.93	1.91	.02	11.92

REPORTS OF KANSAS FARMERS ON SORGHUM.

Cloud County.—S. A. McCall, Oneonta; 6 acres; average yield per acre, 8 tons; crop never fails entirely; better than prairie hay in early winter; good hay is better in early spring; not much difference compared with corn, acre for acre; cost of growing per ton, 75 cents.

Ellis County.—Ed. Polifka, Hays City; 10 acres; average yield per acre, 6 tons; crop never fails entirely; value 1 ton for feed equal to from 1½ to 2 tons of hay; cost of growing per ton, $1.

Finney County.—S. A. Bullard, Garden City; 65 acres; average yield per acre, 10 tons; crop never fails when listed in; much better for feed than hay, if fed in early in winter; do n't think it safe to feed it later than February 15; cost per ton to grow crop, not including cutting, 37½ cents; 2 to 3 tons necessary to keep cow or steer in good condition during feeding season.

Greeley County.—Joseph Guy, Tribune; 10 acres; average yield per acre, 5 tons; 1 ton of sorghum is worth at least 2 tons of prairie hay for feed; 1 one acre of sorghum is worth 3 acres of corn fodder for forage; cost of growing per ton, less than $1.

Grant County.—Wm. Humphreys, Shockey; 25 acres; yield per acre, from 4 to 10 tons; crop never fails entirely; 1 ton of sorghum is worth 2 tons of prairie hay for feed, and is better than corn for fodder; cost per ton of growing, $1.

Hamilton County.—C. C. Boget, Syracuse; 40 acres; average yield per acre, 7 tons; have never known the crop to fail entirely; it is worth twice as much as prairie hay for feed; cost of growing per acre, $1; 2 tons are necessary to keep a cow or steer in good condition during feeding season.

Lincoln County.—J. J. Lambert, Sylvan Grove; 150 acres; average yield per acre, 8 tons; the value of sorghum for feed, compared with prairie hay, is 10 to 1 in dry seasons; it is not as good feed in wet seasons as in dry; 2 tons of good sorghum are sufficient to keep a cow or steer in good condition during the feeding season.

Osborne County.—W. P. O'Brien, Vincent; 11 acres; yield per acre, 5 to 6 tons; crop never fails if a stand is secured and ground in good condition; value of crop compared with prairie hay for feed, 1 ton of sorghum to 2 tons of hay; think it equal to corn fodder; cost per ton of growing, not more than $1.

Pawnee County.—M. K. Krider, Larned; 60 acres; average yield per acre, 5 tons; 1 ton of sorghum is worth 2 tons of prairie hay for feed; cost per acre of growing, including use of land, 80 cents.

Russell County.—Wm. B. Sutton, Russell; 75 acres; average yield per acre, 7 tons; crop never fails entirely; prairie hay is not to be compared with sorghum for feed; cost of growing, 50 to 75 cents per ton; necessary to keep cow or steer in good condition during feeding season, 2 to 3 tons.

Rooks County.—Wm. Pywell, Zurich; 6 acres; average yield per acre, 7 tons; crop has never failed entirely; 1 ton of sorghum is worth 3 tons of prairie hay for feed; necessary to keep a cow or steer in good condition during the feeding season, 1 to 2 tons.

Sheridan County.—T. L. Pratt, Hoxie; 30 acres; average yield per acre, 4 tons; sorghum about equal to prairie hay for feed; I feed hay and sorghum in equal parts; cost of growing and putting in shock, $1.

NET PROFIT PER ACRE IN GROWING BROOM CORN.

It is interesting to know that broom corn is a profitable crop in the western half of Kansas. Soil and climate are so well adapted to this crop, that a superior quality of brush is grown, commanding the highest prices paid in the broom-corn markets.

Farmers representing the central and western belts were asked to report to this Board the net profit in broom-corn growing, and their reports, given below, showing net profit per acre, will be found interesting reading. The reports are as follows:

County.	*Name and post office.*	*Number acres.*	*Cost, per acre.*	*Value, per acre.*	*Profit, per acre.*
Cheyenne	Pat. McCluskey, Saint Francis	40	$5 45	$15 00	$9 55
Edwards	August Peterson, Belpre	40	9 90	16 00	7 10
Edwards	Wm. M. Reeder, Fellsburg	12	9 00	15 00	6 00
Finney	Thos. A. Slagle, Plymell	20	3 85	13 00	9 15
Grant	M. M. Wilson, Zionville	34	4 63	14 00	9 37
Greeley	Jerry Hart, Horace	70	6 75	13 00	6 25
Greeley	S. S. Bailey, Horace	20	5 00	12 25	7 25
Jewell	Isaac Nees, Jewell City	90	7 90	22 00	14 10
Jewell	D. A. Atkins, Esbon	35	9 25	22 50	13 25
Kearny	C. H. Longstreth, supt. L. & L. Co., Lakin	500	6 75	10 50	3 75
Lane	Wm. Kurtenbach, Dighton	15	9 25	19 98	10 73
Rawlins	John Backlund, Ludell	40	7 60	17 50	9 90
Rice	J. F. Justus, Sterling	150	11 70	20 00	8 30
Rush	H. S. Smith	36	6 05	18 00	11 95
Russell	H. A. Ellis, Russell	170	6 50	12 51	4 51
Seward	H. V. Nichols, Liberal	440	6 75	11 65	4 92
Sherman	H. S. Groves, Griswold	15	6 65	15 00	8 35
Stanton	H. A. Lawman, Konantz	40	5 82	16 87	11 05
McPherson	F. G. Hawkinson, Marquette	115	12 10	23 31	11 22
Meade	David Truax, Jalma	10	5 00	16 00	11 00
Morton	J. D. Pratt, Westola	100	5 06	13 21	8 15
Ness	Fred. Roth, Nonchalanta	10	7 25	14 00	6 75
Norton	Thomas Jaquiss, Norton	20	7 25	12 00	4 75
Phillips	J. C. Dilleman, Luctor	20	4 90	9 00	5 10
Pratt	C. W. Phelps, Preston	20	7 50	15 00	7 50
Stevens	J. A. Gregory, Hugoton	30	4 75	16 25	11 50
Thomas	H. H. Miller, Colby	30	5 55	9 37	3 82
Wallace	C. A. Byloff, Sharon Springs	25	8 75	16 25	7 50
Wichita	Elwood Edmondson, Wilkinson	7	6 80	14 95	8 15

VACANT LANDS IN KANSAS.

GOVERNMENT LAND.

THE following tables show, by counties, the approximate number of acres of public lands still remaining vacant in Kansas; also, the location of land offices, and the names of registers and receivers:

Garden City Land District.—Office at Garden City, Finney county. D. M. Frost, register; Jesse Taylor, receiver.

Clark county	12,060 acres.	Hodgeman county	5,760 acres.
Finney	62,549 "	Kearny	74,939 "
Ford	100 "	Meade	49,804 "
Garfield	4,160 "	Morton	49,829 "
Grant	13,480 "	Seward	58,233 "
Gray	10,508 "	Stanton	9,831 "
Hamilton	43,979 "	Stevens	38,586 "
Haskell	15,672 "		

Larned Land District.—Offie at Larned, Pawnee county. H. P. Wolcott, register; E. L. Chapman, receiver.

Barber county	6,215 acres.	Edwards county	2,182 acres.
Barton	2,080 "	Kiowa	2,957 "
Comanche	3,504 "	Stafford	1,895 "

Wa Keeney Land District.—Office at Wa Keeney, Trego county. Hill P. Wilson, register; Lee Monroe, receiver.

Ellis county	15,600 acres.	Scott county	11,800 acres.
Gove	25,120 "	Sheridan	1,120 "
Greeley	14,280 "	Sherman	5,840 "
Lane	8,680 "	Thomas	160 "
Logan	36,680 "	Trego	9,360 "
Ness	2,440 "	Wallace	45,430 "
Rooks	2,680 "	Wichita	1,760 "
Rush	40 "		

Oberlin Land District.—Office at Oberlin, Decatur county. Cyrus Anderson, register; J. B. McGonigal, receiver.

Cheyenne county	59,694 acres.	Rawlins county	17,460 acres.
Decatur	840 "	Sheridan	1,900 "
Graham	560 "	Sherman	4,720 "
Norton	120 "	Thomas	480 "

RAILROAD LANDS.

Union Pacific.—The Kansas Division of the Union Pacific, with headquarters at Omaha, Neb., B. McAllaster, land commissioner, is the only railroad company in Kansas which has lands remaining still for sale, and has the following: Terms of sale, 10 years' credit. One-tenth of the purchase money is paid at the time of sale. At the end of the first year no part of the principal is due, but interest at the rate of 7 per cent. per annum is paid on the deferred principal. At the end of the second year, and each year thereafter, one-tenth of the principal is due, together with in-

terest on the deferred amount at the rate of 7 per cent. per annum. *Example:* 160 acres, sold March 1, 1888, at $4 per acre, $640. The payments would be as follows:

PAYMENTS.	*When due.*	*Principal.*	*Interest.*	*Total.*
First	March 1, 1888	$64 00	.....	$64 00
Second	March 1, 1889	.....	$40 32	40 32
Third	March 1, 1890	64 00	40 32	104 32
Fourth	March 1, 1891	64 00	35 84	99 84
Fifth	March 1, 1892	64 00	31 36	95 36
Sixth	March 1, 1893	64 00	26 88	90 88
Seventh	March 1, 1894	64 00	22 40	86 40
Eighth	March 1, 1895	64 00	17 92	81 92
Ninth	March 1, 1896	64 00	13 44	77 44
Tenth	March 1, 1897	64 00	8 96	72 96
Eleventh	March 1, 1898	64 00	4 48	68 48
Totals		$640 00	$241 92	$881 92

No discount is allowed for cash. Contracts may be paid in full at any time before maturity, and interest will be charged only to the date of final payment; but no discounts will be granted in case of anticipated payments. The lands remaining unsold January 1, 1893, belonging to this company, are as follows:

COUNTIES.	*Acres.*	PRICE.		
		Minimum.	*Maximum.*	*Average.*
Pottawatomie	403	$3 00	$6 50	$4 50
Riley	660	5 50	9 00	7 00
Geary	6,786	5 50	9 00	7 00
Saline	6,811	6 00	12 00	8 00
McPherson	1,045	5 50	8 50	7 50
Ellsworth	12,747	5 50	10 00	7 50
Rice	2,082	8 00	15 00	11 00
Osborne	6,289	5 50	12 00	8 00
Russell	56,236	5 50	12 00	7 50
Barton	1,811	8 00	9 00	.....
Rooks	9,596	5 50	9 00	7 50
Ellis	66,720	3 00	15 00	7 50
Rush	1,090	6 00	10 00	8 00
Trego	13,519	5 50	8 00	6 00
Gove	29,510	5 50	7 00	6 00
Thomas	112,995	3 00	6 00	5 00
Logan	197,611	3 00	6 00	5 00
Wichita	2,442	3 00	6 00	5 00
Sherman	81,318	3 00	6 00	5 00
Wallace	140,730	3 00	6 00	5 00
Greeley	18,083	3 00	6 00	5 00
Clay	323	10 00	10 00	10 00
Dickinson	342	10 00	10 00	10 00

Atchison, Topeka & Santa Fé.—The Atchison, Topeka & Santa Fé railroad, with headquarters at Topeka, Kas., Jno. E. Frost, land commissioner, is offering for sale a few choice tracts of reverted lands in the Arkansas river valley, in south-central and southwest Kansas, on the following terms, namely: (1) Eleven years' credit, with 7 per cent. interest. The first payment, at date of purchase, is one-tenth of the principal and 7 per cent. interest on the remainder. At the end of the first and second years, only the interest at 7 per cent. is paid; the third year and each year thereafter one-tenth of the principal is paid, with 7 per cent. annual interest on the remainder until the whole is paid. Or, (2) Six years' credit, with 7 per cent. interest. The first payment at date of purchase is one-sixth of the principal, and 7 per cent. interest on the remainder. The second payment, at the end of the first year, is only interest; afterward, one-sixth of the principal is paid, and 7 per cent. annnal interest on the remainder until the whole is paid. A discount of 10

STATE HOUSE, TOPEKA, KAS.